Producing “the necessary evil” –

Documentation process and status of technical communication at a manufacturing company

Marjukka Rajamäki
University of Tampere
Faculty of Communication Sciences
Master’s Programme in Multilingual Communication and Translation Studies
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Tämä tutkielma kuuluu teknisen viestinnän alaan ja käsittelee siihen kuuluvia prosesseja. Kyseessä on laadullinen tapaustutkimus, jossa tarkastellaan, millainen tutkimuksen kohteena olevan teollisuusyrityksen nykyinen dokumentointiprosessi on ja miten prosessia voitaisiin kehittää tulevaisuudessa. Lisäksi tutkimuksessa tarkastellaan teknisen viestinnän statusta yrityksessä. Tavoitteena on kehittää uusi prosessimalli yritykselle. Tutkimuksen oletuksena on, että nykyisessä dokumentointiprosessissa on ongelmia, jotka haittaavat muita prosesseja ja teknisen dokumentaation laatua.

Tutkimuksen lähtökohtana ovat harjoittelujakson aikana nousseet kysymykset siitä, miksi viimeisimmän dokumentointiprojektin valmistumisessa oli ongelmia, sekä yrityksen prosessikaavio, jossa ei eritellä dokumentaation tuottamiseen liittyviä vaiheita. Tutkimuksen aineisto kerättiin puolistrukturoidulla haastattelumenetelmällä, ja tutkimukseen haastateltiin viittä yrityksen työntekijää, jotka osallistuvat dokumentointiprosessin eri vaiheisiin yrityksessä.

Tutkimuksessa esitellään Hackosin (1994), Haramundanisin (1998) ja Kisterin (2016) dokumentointiprosessimallit, joita käytetään sekä nykyisen prosessin arvioimiseen että uuden prosessimallin kehittämiseen. Nykyistä dokumentointiprosessia arvioidaan myös vertaamalla sitä Hackosin (1994) prosessien kypsyysmalliin, joka antaa viitteitä nykyprosessin kypsyydestä ja prosessin kehittämiseen tarvittavista muutoksista.

Tutkimuksen tulokset osoittavat, että yrityksen nykyisessä dokumentointiprosessissa on ongelmia, jotka ilmenevät erityisesti dokumentaation valmistumisessa ja laatuvaatimusten täyttämisessä. Ongelmat juontuvat lähtökohtaisesti puutteellisesta prosessijohtamisesta ja vakiintumattomasta prosessista. Teknisen viestinnän status on yrityksessä jokseenkin alhainen, sillä vaikka laadukkaan dokumentaation merkitys yritykselle on työntekijöiden tiedossa, dokumentointitehtävät koetaan ikäviksi ja hankaliksi. Tutkimustulokset siis tukevat hypoteesia, sillä prosessissa on ongelmia, jotka vaikuttavat sekä dokumentaation laatuun että muihin prosesseihin, kuten käännösprosessiin. Prosessin kehittämiseksi suositellaan prosessipäällikön nimittämistä, dokumentointiin liittyvää koulutusta, laatukriteerien kehittämistä sekä uuden prosessimallin käyttöönottoa. Jatkotutkimusta muutosten toimeenpanemisen onnistumisesta kohdeyrityksessä tarvittaisiin, jotta uuden prosessimallin sopivuutta yrityksen toimintaan voitaisiin arvioida. Lisäksi samanlaisia tapaustutkimuksia muiden yritysten dokumentointiprosesseista tarvittaisiin niin Suomessa kuin ulkomaillakin, jotta dokumentoinnin tilasta saataisiin kattavampi yleiskuva teknisen viestinnän alalla.

Avainsanat: tekninen viestintä, tekninen dokumentointi, dokumentointiprosessi, status

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1 Introduction

All businesses are formed by a network of interconnecting processes (Slack 2013, 19), which together affect the quality of the produced product (Laamanen 2009, 67). Therefore, the state of the processes of a company has an effect on the product to be produced. However, not all processes are always considered equal in the workplace, which affects the operation of those processes. Such has often been the case with the production of technical documentation – documents used for instruction, marketing, and reportage (Haramundanis 1998, 2–3) – because technical documentation has not been considered valued (Redish 2003, 505; Savage 2003, 149; Spilka 2000, 219) and worthwhile to be invested in (Ward 2015). If the documentation process is not regarded as a process worth taking into account, its state can affect the performance of the company and the quality of the product.

In this study, I will investigate both the documentation process and the status of technical communication in a manufacturing company. The research questions of this study thus are:

- What is the state of the current documentation process at the target company?
- What is the status of technical communication in the target company?
- How could the documentation process be improved?

The motivation for this study arose during my traineeship at a Finnish manufacturing company, which designs, markets, and manufactures agricultural and forestry machinery. Before my traineeship, the target company had started to update its business image to the current day, which also led to the need to reform the technical documentation of the target company. Therefore, I participated in updating the conventions of the technical documentation during my traineeship by producing the user manual and spare parts catalogue of the agricultural machinery according those new conventions. (Traineeship 2015.)

When I started to develop the manual and the spare parts catalogue of the agricultural machinery, the first version of the technical documentation had already been done by the product developers. However, the project was running late as the deadline for the final version of the technical documentation had been two months prior to my traineeship. One of the reasons for the delay might have been the unique circumstances in which the documentation project was conducted: in addition to the reform and a completely new series of products, the

target company was in the process of changing the documentation tools from CorelDraw to InDesign (Traineeship 2015). Moreover, while updating technical documentation is common at the target company, producing new manuals from the beginning is rare (Traineeship 2015), which may be the reason why the process might not be as firmly in place in the company as it could be. However, despite these circumstances, I started to wonder whether there were other reasons as well for not producing the final version of the technical documentation on time. Therefore, I assume that there are issues in the documentation process of the target company, which affect both the other processes and the quality of the company's technical documentation.

As the aim of this study is to examine both the state of the current documentation process as well as the status of the technical communication at the target company, the study is carried out by interviewing the employees participating in the process. The information gathered in the interviews is then assessed by comparing it to the process maturity model designed by a known expert in the fields of content management and information design, JoAnn Hackos (1994). Comparing the information to Hackos' process maturity model gives insight into the current state of the documentation process and the changes to be made when improving the process. After the maturity of the process has been assessed, I will develop a model for the new documentation process. As developing a process includes illustrating the current process and its improvement areas, in addition to modelling the target process (Lecklin 2006, 134), I will illustrate the current documentation process of the target company, pinpoint issues regarding it, and develop a new development model for the documentation process. The new model will be based on three different development models formulated by Hackos (1994), Katherine Haramundanis (1998), and Tina Kister (2016).

In general, the development of processes includes analysing the current state of the process, analysing the possible problems in the process, and developing solutions for the problems (Lecklin 2006, 134). Additionally, the development of processes involves producing and implementing a model for the target process, as well as continuously improving the established process (Lecklin 2006, 134). Therefore, this study provides a starting point for developing the documentation process at the target company by carrying out a current state analysis and proposing changes to the process, and leaves responsibility for implementing changes to the target company.

As this study concentrates on the documentation process in a specific company, it is a qualitative case study, which is why the results of the study are especially useful for the company in question. However, although the study investigates the process of a specific company, it can provide useful information on documentation processes for other similar companies. The results can also give indications to other similar companies on how to improve their documentation processes.

In Chapter 2, I will discuss the status of the field of technical communication in general, while in Chapter 3 I will discuss the development of documentation processes and introduce the process maturity model and the target company's process flow diagram as well as the three development models applied in this study. Then, I will present the research method in Chapter 4 and the results in Chapter 5. In Chapter 6, I will discuss and assess the current documentation process as well as the status of technical communication at the target company. Additionally, I will introduce the model for the new documentation process and discuss the changes required. Finally, in Chapter 7, I will reflect the study at hand and discuss possible future research topics that arise from the study.

2 Status of technical communication

This chapter looks into the status of technical communication to provide background information for the discussion of the status of the field in the target company. In this chapter, I will discuss the connection between status and professionalism, the current status of technical communication, and the reasons behind it. I will also discuss the value the field delivers to companies as well as producing quality in technical documentation to bring that value to the companies.

2.1 Status of a profession

The status of technical communication has been an ongoing concern for both practitioners and academics in the field (Sullivan 2003, 116), because a technical communicator's work is often not valued in the workplace (Savage 2003, 149; Spilka 2000, 219). As status refers essentially to "the valuation by a society where professionals function" (Kynell-Hunt 2003, 59), valuation by the people around the technical communicator is also required for a high status. As the above definition indicates, the status stems from the work of professionals, which is why professionalism – or the lack of it – has been argued to be the core reason behind the low status of the field (Spilka 2002).

Rachel Spilka (2002, 98–99) states that while with its theory, research, training, and history of practical work, technical communication can be categorised as a field, it cannot be called a profession. According to her, a profession shares the features of a field, but it also has other features, including systematic means of working, community with a clear vision, organisations representing the professionals, and universal recognition. Spilka (2002, 99) argues that technical communication lacks all of these distinctive features of a profession and concludes that "members of a profession generally enjoy status, prestige, and power both within a particular organisation and among the general public". As mentioned earlier, to enjoy status means to be valued by society. Therefore, of the features distinguishing a profession from a field, universal recognition – society's knowledge of the work of the professionals (Spilka 2002, 98) – is ultimately the feature to be taken into account when discussing the status of technical communication.

According to Spilka (2002, 98), universal recognition is based on, for instance, the title and the definition of the field. It is no wonder then that the numerous titles for the field, such as *technical communication*, *technical writing*, *document design*, and *information design* as

listed by Spilka (2002, 101), have created confusion since the early days of the field not only in society but also in technical communicators themselves (Britton 1965, 113; Jones 1996, 3). Moreover, if the number of titles for the field creates confusion, so does the plethora of definitions. The problem of different definitions has been recognised in the field, and academics have made suggestions for an apt definition (Spilka 2002, 102). In the early days of the field, instead of creating a single definition, many academics only succeeded in naming characteristics of the field. For example, Gordon Mills and John Walter (1954, cited in Britton 1965, 113) explained that one essential feature of technical writing is that "technical writing is concerned with a technical subject matter", while Robert Hays (1961, reprinted in Jones 1996, 31) suggested that technical writing differs from nontechnical writing because "technical style demands a specialized vocabulary. . . ." The suggested characterisations are rather limiting as they focus on specific features of technical documentation, namely subject matter and style. Henning and Bemer (2016, 332) note that in order to create a flexible definition, the definition should focus on the process instead of the product. They explain that the specific methods and goals that separate technical communicators from other types of communicators should be emphasised in the definition. Thus, Henning and Bemer deduce that the definition should state the goal of producing usable information for specific audiences, and the method of employing theories and conventions to reach that goal.

Spilka (2002, 98) notes that nowadays most of the definitions reflect the importance of the user of technical documentation. For example, David Dobrin (1983, 242–243) concludes that technical writing is "writing that accommodates technology to the user", and Karen Schriver (1997, 10) defines document design as being "concerned with creating texts (broadly defined) that integrate words and pictures in ways that help people to achieve their specific goals. . . ." In this study, I refer to the field of technical communication with a more process-oriented definition presented by Suvi Isohella (2011, 51), who defines technical communication as "the design, production, transmission, and communication of technical knowledge" [my translation]. Isohella's definition specifies the different activities included in developing technical documentation and is thus suitable for this study. However, in order not to forget the importance of the user when developing technical documentation, I would like to add the user to the definition as follows:

- *Technical communication* is the design, production, transmission, and communication of technical knowledge to the user.

Defining technical communication is difficult because it "differs from business to business, product to product and company to company" (Spilka 2002, 103; Rainey 2005, 200). For example, technical communicators may work in different kinds of work settings: in Finland, some of the practitioners work as in-house technical communicators in software companies and factories, while others work for service companies (STVY 2016). Additionally, the number of different types of technical documentation produced, such as user manuals, online helps, marketing materials, and a myriad of different products documented (STVY 2016) do not make defining the field any easier. Therefore, although a single definition for the field could create a basis for establishing professional status for technical communication, it is unlikely that any definition would sufficiently describe it without excluding any activities performed in the field, because a definition tends to limit what it is defining (Allen 1990, reprinted in Jones 1996; Henning & Bremer 2016, 324). However, the diversity of the field could actually be an advantage that gains more respect for technical communication in the future (Spilka 2002, 104).

Despite a lack of consensus about the title and the definition, some academics find the field to be well on its way to becoming a profession (Pringle & Williams 2005; Coppola 2012). For example, based on a brief survey, Kathy Pringle and Sean Williams (2005) state that the field is gaining professional status having recognised its common goal – to create and communicate information to audiences by employing tools – which has remained unchanged from the early days and is likely to remain the same in the future. According to Pringle and Williams (2005), this recognition forms a group identity among technical communicators, which eventually leads to a professional status. However, as status by definition requires valuation by the people around the technical communicators, it is difficult to see how group identity alone could establish it. Therefore, in order to gain that valuation, technical communicators themselves are encouraged to actively raise public interest in the field (Coppola 2012, 4; Faber 2002, 330; Hayhoe 2003). However, because of the lack of consensus about something as essential as defining the field, steps to successful advocacy can be difficult.

2.2 Professionalization in Finland

The research on technical communication in Finland is scarce (Suojanen 2000, 33; Virtaluoto 2015, 60), which is why we do not have a solid overview of the status of Finnish technical communication. However, studies by Jenni Korhonen (2007) and Jenni Virtaluoto (2015) are

worth considering as they might give some indication on the real status of the field in Finland. In her dissertation, Virtaluoto (2015, 18) suggests that, just like their North American counterparts, Finnish technical communicators struggle for status because technical communication has not yet reached the status of a profession. Virtaluoto bases her suggestion on a small data, which she gathered by interviewing 13 practitioners in three separate studies. Korhonen (2007) draws a similar conclusion on the results of her survey, which was answered by 96 practitioners: although the practitioners in Korhonen's study valued their own field, they said that the technical communication is not valued in the workplace. Moreover, Virtaluoto (2015, 68) states that the low status of the field manifests itself in the ongoing situation where companies outsource and offshore technical communicators' jobs because of the poor financial situation in the country. Therefore, the results of the studies imply that the struggles for status of technical communication in Finland result from a lack of valuation by society, which, as discussed in subsection 2.1, is also the reason for similar struggles of the field noted in North American literature.

Just like North American literature (see, for example Savage 2003; Spilka 2000), the studies by Korhonen (2007) and Virtaluoto (2015) indicate that this lack of valuation manifests itself in the Finnish workplace. However, the valuation of technical communicators' work in the workplace seems to vary by company. The results in Korhonen's study (2007) show that while 51.1% of the informants considered to be as valued as their colleagues at work, 44.6% of the participants considered themselves to be less valued. Those who considered themselves to be valued to the same extent as their colleagues gave reasons such as working in a service company specialised in technical communication or having a supervisor with a background in technical communication. Those who considered being less valued at work, on the other hand, mentioned that their colleagues do not understand the importance of technical documentation or know the work tasks of the technical communicator. These answers indicate that an awareness of technical communicators' work might be one of the issues behind the low status of the field in Finland, as it is overseas.

In addition to people's lack of knowledge of the field, the history of technical communication might contribute to the difficulties in professionalization, because prior to the emergence of the professional technical communicator in Finland, documenting products was – as it still is in many companies – one of the work tasks of an engineer. Tytti Suojanen (2008, 67–68) distinguishes two traditions of Finnish technical communication called *engineering-based*

documentation and *humanist-based documentation* [my translation]. By engineering-based documentation, Suojanen refers to documentation traditionally being one of the tasks of an engineer, while in humanist-based documentation, technical documentation is prepared by language specialists with a background in the humanities. According to Suojanen, the demand for language specialists performing documentation tasks arose in the 1980s when English became the documentation language for software products. This demand eventually led to the formation of technical communication as a field in Finland during the rapid development of information technology in the 1990s (Suojanen 2000, 1).

The shift from documentation engineers to professional communicators with a humanistic background can also be found in the history of the field in the United States. Just as in Finland, technical documentation was produced by engineers in the United States before the emergence of the field. As the technological advances during the World War II increased the need for manuals, companies realised that it was not cost-effective to pay engineers both to design and to write (Connors 2004, 12). Moreover, the companies recognised the importance of the usability of the technical documentation when the new technology became available for consumers, who started to demand high-quality information products (Pringle & Williams 2005, 363).

Although the need for technical communicators has been recognised in the past, notions of documenting being an additional task has persisted since the early days of the field. For example, in the 1970s the American industry considered technical communicators "ancillary [and] easily expendable in hard times" (Kynell-Hunt 2003, 60). Moreover, common thoughts on technical communication in the workplace include "anyone can write" and "documentation isn't so important anyway" expressed by product managers and developers (Redish 2003, 505). Furthermore, according to Virtaluoto (2015, 16), technical communication is still often seen as a routine task, which is evaluated by price rather than quality. Perhaps these notions persist because engineering-based documentation has not disappeared with the emergence of technical communicators: not all of the companies producing technical documentation employ technical communicators. For example, in the target company, producing the content for technical documentation is one of the tasks of the product developers.

Technical communication is unlikely to disappear because product documentation is required by customer protection legislation in many countries (Virtaluoto, 2015, 67). For example, in Finland, the safety of machinery is regulated by the Machinery Directive (Tukes 2013),

according to which machinery producers, such as the target company, have to provide appropriate technical documentation on their products. Moreover – and more importantly – ongoing technological innovations continue to pose a need for technical documentation. If the history of technical communication in Finland and overseas gives any indication, users of technology will need usable information in the future as well.

2.3 The value of technical communication

Although technical communicators deliver value by producing usable and accessible information for end users, which advances the goals of companies (STC 2016), many companies view technical communication predominantly as a business expense (Ward 2015). This kind of approach to technical communication leads to a lack of recognition of technical communicators and a lack of appropriate funding in companies (Redish 2003, 505), not to mention a lack of quality in technical documentation (Virtaluoto 2015). Christopher Ward (2015) calls for a change of a mindset in companies and explains that "technical communication has now become a pivotal component in revenue generation for successful companies and should be therefore considered as an investment".

Changing the mindset in companies has been seen as a way to improve the status of technical communication. Janice Redish (2003) encourages technical communicators to justify their roles by showing how they add value to the company. In addition to Ward (2015), Redish defines the value of technical communication as return on investment. She goes on to explain that technical communicators can either reduce investment or improve the return on investment "without sacrificing quality". According to Redish, reducing investment can be done, for example, by reducing printing costs, but if reducing investment leads to less accurate or less readable documentation, it may generate less return on investment. Thus, instead on concentrating on reducing investment, technical communicators should focus on return on investment which would cover the costs even if plenty of resources were spent on technical documentation.

Redish (2003) rightly points out that focusing on return on investment means considering the whole life cycle of technical documentation. When counting costs and benefits, all of the phases, including design, development, support, maintenance, and revision should be taken into account. Redish adds that "getting it right" during the design and development phases is much less expensive than solving problems later. Moreover, Redish concludes that problems

in processes can hinder producing value. In my opinion, the whole documentation process with its resources affect the success of delivering high-quality technical documentation and therefore value for the company, which is why the importance of technical documentation along with appropriate processes should be emphasised in companies.

In addition to showing how technical communicators deliver value, involving technical communicators in product development processes could also change the mindset in companies, as the work community becomes aware of their work. Involving technical communicators in the product development processes has been voiced throughout the history of the field: since the 1970s technical communicators have understood the importance of being an active part of the process (Jones 1996, 3). However, company's support for active participation in the product development process seems improbable if the work of technical communicators is neither understood nor valued in the workplace, as discussed in subsection 2.2. Nevertheless, technical communicators are still encouraged to take active roles in organisational processes in order to enhance their status (see, for example, Giammona 2011; Hart & Conklin 2011). This way, technical communicators would be able not only to deliver value to the companies by producing quality technical documentation but also, as discussed in subsection 2.1, to improve the status of technical communication as a profession.

2.4 Delivering value through quality

Good quality of products – including information products, such as technical documentation – or services can give a company a competitive edge by increasing revenues, decreasing costs, and generating customer satisfaction (Slack 2013, 534–536). Therefore, it is no wonder that one of the aims of the target company is to develop and maintain the quality of its products (Traineeship 2015). However, producing quality can be difficult because notions of quality vary by person and situation (Lecklin 2009, 15). In terms of technical documentation, Hackos (1994, 11) explains that quality for marketing and sales might mean attractive documentation, whereas for product developers it is a complete technical description of the product. Some of the definitions emphasise the importance of customers: for example, quality has been defined as "a consistent conformance to customers' expectations" (Slack 2013, 536) in the field of operations management and as "meeting the needs of the customer as efficiently and cost-effectively for the company as possible" (Lecklin 2009, 18 [my translation]) in the field of quality management. Similarly, in the field of technical communication, the quality of

technical documentation is often defined as meeting the needs of the customer (Hackos 1994, 10–12).

Another definition for quality documentation has been provided by Patricia Wright (1994, 33), who states that "a quality document is one that provokes quality reading", and says that most important criteria for quality is usability. While Wright (1994, 10–13) agrees that both quality and usability are elusive concepts, she explains that one way to see the difference between the two is to consider whether documentation is viewed as a written product or as a working environment. If documentation is produced as a written product, writers may find quality documentation to include all the available information, which, in turn, places the responsibility for gathering relevant information to the reader instead of the writer. On the other hand, producing documentation as a working environment, that is, by taking into account the way the reader uses the documentation, contributes to the usability of the documentation. To my mind, therefore, it is important to note that producing quality starts at the beginning of the documentation process when the documentation is designed from the user's point of view.

Hackos (1994, 10) supports Wright's notion on usability being a characteristic of quality by agreeing that quality depends at least partly on the perceptions of the users of technical documentation. However, perceptions of the users as part of quality are easily disregarded because measuring them is difficult. Thomas Warren (1994, 171–172) explains that the difficulty in defining quality is whether to consider quality as a characteristic or as a value judgment, and whether or not it is measurable in nature. Warren divides different characteristics of quality into primary and secondary characteristics. Primary characteristics include observable aspects of quality, which are measurable, whereas secondary characteristics include aspects that are relative to the observer and are, thus, difficult to quantify. Therefore, measuring the perceptions of the users is difficult because they depend on the user.

As primary characteristics are easily measured, they have traditionally been considered when assessing the quality of technical documentation (Hackos 1994, 10; Warren 1994, 173). Hackos (1994, 10) explains that the measurable characteristics of documentation, such as spelling, grammar, and formatting, are relatively easy to correct, but they alone do not contribute to user-centred documentation. Therefore, although measurable characteristics contribute to the appearance and credibility of the documentation, if the content and the style

of the documentation are not regarded from the user's point of view when producing the documentation, it is unlikely to be usable.

If the aim is to produce high-quality, user-centred documentation, it is important to concentrate on all the different aspects of quality, both the observable and the non-observable features of it. According to Hackos (1994, 14–24), producing high-quality documentation is assisted by factors such as sound standards, talented people, and useful tools, but they are not enough. She states that the most important factor in establishing quality in documentation is managing the overall documentation process, as it ensures that the other factors are used accordingly and consistently. Thus, essentially quality is realised in processes (Laamanen 2009, 67). Furthermore, in addition to producing high-quality technical documentation, a documentation process presents the opportunity to estimate a budget and a schedule as well as respond to changes in the project (Hackos 1994, 20).

Considering only measurable characteristics of quality usually manifests itself in conducting quality assurance at the end of the documentation process (Hackos 1994, 10). Markus Nickl (2012) notes that if quality assurance is conducted seriously in the documentation process, it does not only focus on correcting errors from documents and should not be regarded as a phase which can be shortened as required. He calls for a continuous quality assurance, which means integrating both proofreading and editing in the documentation process from the beginning of the process. Nickl claims that this leads to a situation in which no errors arise at all in the project, which, in my opinion, is a too positive a notion: there is always a possibility for human errors. Furthermore, even if avoiding all errors was possible with the means of continuous quality assurance, this would be difficult to ensure in the phases of the process performed by outside vendors, such as translation agencies.

Nickl (2012) explains that quality assurance has often been conducted by proofreading, which only focuses on the surface of the text, such as spelling, grammar, and terminology. Editing, on the other hand, focuses on the non-observable aspects of documentation that more significantly affect quality. These aspects include factual accuracy, completeness, structure, conformance to standards, and style. As there is often little time for several editing cycles at the end of the project, Nickl recommends planning different editing phases which are focused on particular aspects of editing. Nickl suggests that editing could include four phases focusing on different factors as follows:

- Phase 1: Content
- Phase 2: Style
- Phase 3: Grammar and spelling
- Phase 4: Sentence, syllables, and layouts

In addition to introducing editing phases, Nickl (2012) notes that to perform quality assurance accordingly, various tools such as style guides, terminologies, standards, and checklists should be used by qualified employees. Similarly, Kit Brown-Hoekstra (2010) mentions templates, style guides, terminologies, trained team members, and the whole editing phase as means to be applied in the documentation process before the source text enters the translation process. Nickl's suggestion on editing phases will be considered when formulating a new development model for the target company in subsection 6.3.

All in all, it seems that producing high-quality technical documentation is affected by the nature of the whole documentation process. However, justifying the need for a managed documentation process, or specific phases, for that matter, by quality may not always be effective, as decision-makers tend to require more tangible reasons, such as financial benefits. In order to explain the value of editing, Geoff Hart (2007) provides reasons such as reducing translation costs and eliminating reprinting costs. However, editing as one of the phases in the process cannot alone create quality, because, as already mentioned, the quality of technical documentation means different things for different people from a timely delivery, inexpensiveness, accuracy, and usability to meeting the needs of the user (Hackos 1994, 11–12; Warren 1994, 174). Therefore, instead of focusing on a specific aspect of the documentation process, it is necessary to develop it as a whole.

3 Developing a documentation process

In this chapter, I will discuss documentation as a process, its relationship with other processes of a company, and the importance of managing it. I will also discuss how processes can be developed with models and introduce Hackos' (1994) process maturity model as well as the process flow diagram (Appendix 1) of the target company. Finally, I will present and compare the development models of Hackos (1994), Haramundanis (1998), and Kister (2016) applied in this study.

3.1 Documentation process in a network of processes

A process can be defined as "an arrangement of resources that create some mixture of service and product" (Slack 2013, 19) or "a set of interrelated activities designed to transform inputs into outputs" (Berman 2014, 15). Moreover, in the field of technical communication, a documentation process has been defined by Hackos (1994, 20) as a set of procedures, standards, and management methods that is used to produce consistently high-quality technical documentation. However, Hackos' definition for the documentation process is not the only one in the field. In addition to the variety of titles and definitions for the field discussed in subsection 2.1, some terms are used to refer to both the documentation process and the product of the process. For example, Haramundanis' definition (1998, 1) is twofold, because she defines technical documentation as both the work to be done while preparing technical documents and the result of that work. Similarly, Mike Markel (2012, 4–5) defines technical communication both as the process of making and sharing information in the workplace and as the written documents resulting from the process. As both the process and the documentation are discussed in this study, it is necessary to refer to them with two different terms. Therefore, I define the two terms as follows:

- *Documentation process* is a set of interrelated activities for which resources are utilised to produce consistently high-quality technical documentation.

- *Technical documentation* is the result of the target company's documentation process, which, in this study, includes only user manuals and spare parts catalogues, and excludes other material, such as assembly instructions, normally regarded as part of technical documentation in the target company.

As any business, such as the target company, is formed by a network of interconnecting processes (Slack 2013, 19), the state of the other processes and their effects on each other should be taken into account when developing a process. The documentation process is no exception. For example, Hackos (1994) points out that the level of maturity of other processes, such as product development and marketing, affect the documentation process and the success of introducing a developed documentation process to the company. The introduction of a new documentation process is supposed to be easier, if the company already follows a product development model. In my opinion, the documentation process is undoubtedly most affected by product development, because the processes produce products that should be released at the same time, as they are to be used together.

As the technical documentation is supposed to be released together with the documented product, it is necessary to consider the relation between the documentation process and the product development process. For example, if the documentation process begins late in relation to the product development process, it is difficult to produce high-quality technical documentation (Hackos 1994, 39). This has also occurred in the target company, where the first released version of the documentation in the latest documentation project, that I shall here call project X, was produced late in the product development process (Traineeship 2015). Richard Chisholm (1988, 301–305, 311) calls this kind of a documentation process *an end-loaded document cycle*, which he says leads to problems such as a lack of time and a lack of information sources required for quality technical documentation. Chisholm argues that a documentation process should span the entire product development process, and that the documentation process should not only parallel with the product development process but also interact with it. According to Chisholm, this interaction would benefit both processes: the technical communicators would contribute design ideas as well as information on the users' needs to the product developers while obtaining information on the product.

Other processes interconnecting with the documentation process often include a translation process, which in Hackos' process model presented in subsection 3.4.1 is a process to be performed before the technical documentation can be published in other languages. Brown-Hoekstra (2010) rightly points out that "quality translation really begins with content creation and the processes that support it. . . ." Thus, the quality or the lack of quality of technical documentation produced in the documentation process is likely to reflect in the translations as well. Brown-Hoekstra adds that successfully integrating the translation process to other

processes is financially beneficial, because the earlier problems in the technical documentation are detected, the less it will cost to solve them.

The quality of technical documentation, both the primary version and the translations, is important because, as Brown-Hoekstra (2010) points out, many countries' regulations demand material in the local language, particularly for products that involve safety considerations, such as heavy equipment or medical services. Therefore, the importance of taking the translation process into consideration in the companies in the heavy industry, such as the target company, cannot be ignored. However, although it is necessary to take into account interconnecting processes when aiming to produce quality technical documentation, I will only focus on the documentation process because of the limited scope of the thesis.

3.2 Importance of managing processes

Smoothly interacting processes alone do not guarantee success in business. Hackos (1994, 20–21) states that, even if a sound process has been established in a company, the process is unlikely to produce desirable results, if it is not managed and followed. She describes a managed process as being "under control", which, even in an event of a change, meets the objectives set for the project. Moreover, Hackos lists tasks such as estimating the project scope, time, and resources as well as defining the milestones and objectives as part of managing a process. Additionally, Chisholm (1988, 299) states that "effective and efficient management relies on the optimum use of resources – time, money, personnel, and information". To my mind, the most critical phase in a documentation project is in the beginning when the use of these resources is planned. This is because, as Hackos (1994, 21) points out, "poor planning results in unrealistic deadlines, inadequate resources, and one crisis after another".

Just like Hackos, Chisholm (1988, 304–307) considers the problems of a documentation project, such as a lack of time and a lack of information sources, to be the result of poor management. As discussed in subsection 3.1, this could easily be solved by making the documentation process interact with the product development process from the beginning. However, Chisholm elaborates that poor management – and its resulting problems – essentially stem from managers failing to understand the importance of both technical documentation and the documentation process. As discussed in subsection 2.3, not understanding how quality documentation adds value to the company leads to problems in the

documentation process. It seems that a manager who understands the importance of the documentation process is imperative for a smooth production of technical documentation, because the manager has influence on the amount of resources, such as time and money.

3.3 Developing processes with models

In this study, I aim to develop the documentation process at the target company by developing a model for the new documentation process. Creating a development model, however, is only a part of developing processes. Olli Lecklin (2006, 134) identifies three phases in developing processes. These phases are depicted in Diagram 1.

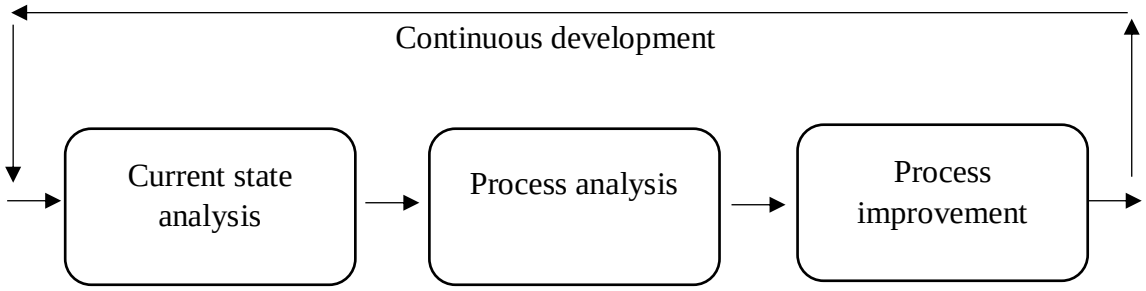

Diagram 1. Phases in developing processes (Lecklin 2006, 134 [my translation])

According to Lecklin's (2006, 134) model, developing processes begins with a current state analysis in which information on the current process is gathered and illustrated in a model. Then, in the process analysis phase, the possible problems in the current process are analysed, and improvement options are developed and analysed. Finally, in the process improvement phase, an improvement plan which contains a model for target process is produced and implemented. The process improvement phase may also include testing of the new model before it is implemented. After the implementation, the process should be continuously improved by assessing and modifying it regularly.

This study follows Lecklin's model by first gathering information on the current process of the target company, and then analysing it by comparing it to an existing process maturity model in the field of technical communication. However, because of the scope of the thesis, this study only partly follows the process improvement phase: I only aim to analyse the target company's current documentation process and its possible improvement areas, and to create a new process model. Therefore, this study provides theoretically the most suitable process for the target company, but its suitability in practice remains to be tested in the working context.

Another important aspect in process development to be considered is the response of the people who are affected by the change in a process, because implementation of process models does not ensure that they are managed and followed. This calls for commitment, which Kai Laamanen (2007, 260–262) defines as taking the initiative for change. He notes that acknowledging, understanding, and accepting change are important factors fostering commitment. Even if participants were informed of the changes in business, information alone is unlikely to generate strong commitment to change. However, when the participants understand the reason for the change and consider its advantages and disadvantages to their life, they will either approve or disapprove change and act according to their choice.

According to Laamanen (2007, 261–262), participation elicits commitment, and if people were participating in all phases of change from identifying the need for change to resolving problems and testing solutions, they would be more strongly committed to change. Although the scope of this study is limited, and evaluating the success of the new process is not possible, I will use the interviews to gather information on not only the documentation process in general but also the commitment to improving processes. Furthermore, in addition to investigating the commitment of the interviewees, the interview results are likely to indicate what kind of status technical communication has in the target company.

3.3.1 Documentation process maturity

In order to determine the state of the current documentation process of the target company, the characteristics of the current process are analysed according to Hackos' (1994, 44–74) process maturity model. The maturity model is based on Hackos' studies on operations in publications organisations, and it includes six levels of process maturity. According to Hackos (1994, 44), the maturity model can be used for both assessing the documentation process and planning the changes that need to be carried out before moving on to the next level of process maturity. Therefore, in addition to assessing the maturity of the documentation process of the target company, the changes required to improve the process described in the maturity model are taken into account in the study at hand. Diagram 2 presents the six levels of process maturity defined by Hackos (1994, 44–74).

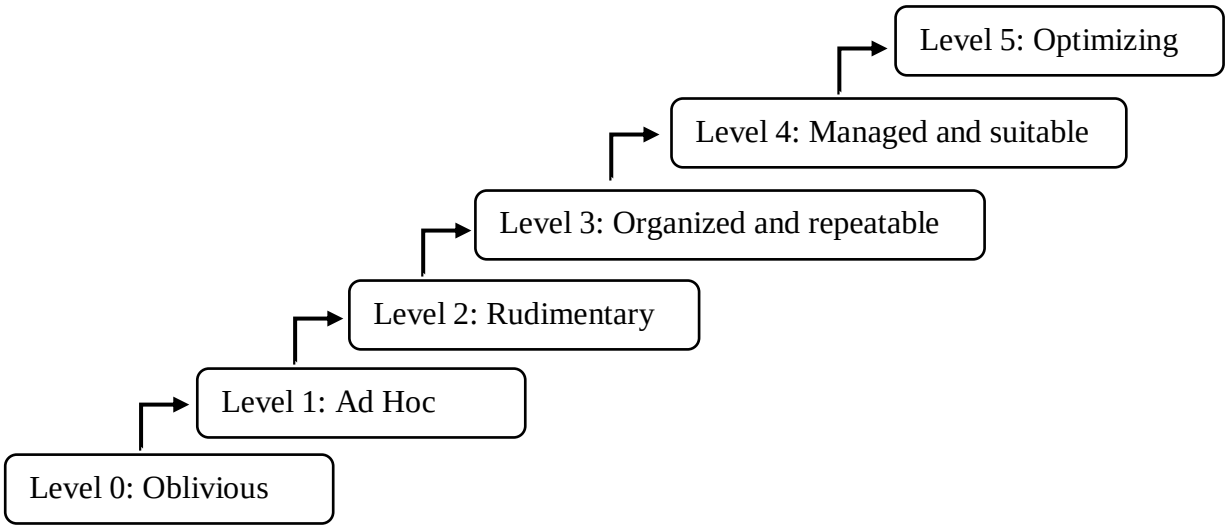

Diagram 2. Process maturity model (applied from Hackos 1994, 47)

Most of the publications organisations studied by Hackos (1997, 46) fall either into Level 1 or Level 2 of process maturity, and only few are at Level 3. She adds that some organisations are at Level 0. Furthermore, as Levels 4 and 5 are, according to Hackos (1994, 46), only ideal, they are not discussed in this thesis. As the process maturity in the target company is more likely to be at one of the earlier levels, – project X began late in the product development process (Traineeship 2015) – I will consider Levels 0, 1, 2, and 3 when analysing the documentation process of the target company. Hackos (1994, 46–68) describes the first four levels of process maturity as follows:

- **Level 0: Oblivious.** An oblivious organisation does not recognise documentation as a process. The technical documentation is produced by some other than technical communicators such as subject matter experts, marketing specialists, and field engineers. The experts do not have the time, skills, or inclination to produce quality documentation. The experts do not think that technical communicators are needed in the company. The changes required for moving from Level 0 to Level 1 include hiring technical communicators, who would produce more usable technical documentation and possibly establish a sound documentation process in the organisation.

- **Level 1: Ad Hoc.** An ad hoc organisation lacks an established process. The documentation projects are not planned, and they usually begin late in the product development process. The quality of the documentation product cannot be assured because of time constraints. Moreover, technical documentation is not written in a

uniform manner because it is produced by different contributors. The organisation has technical communicators who work independently, and little project management and teamwork takes place. The changes required for moving from Level 1 to Level 2 include a more organised documentation process introduced by, for example, a new employee or an outside consultant, and the development of standards for technical documentation.

- **Level 2: Rudimentary.** Rudimentary organisations have developed a base for the documentation process. The organisation makes effort in planning the documentation projects by making a description of the project and an outline of the document to be produced. Project management is still absent, which means that the project is not prepared for changes. The changes required for moving from Level 2 to Level 3 include naming a manager that would facilitate commitment to the established documentation process and planning in the documentation projects.

- **Level 3: Organized and repeatable.** A Level 3 organisation is well on its way to a fully developed process. Plans about the project and the technical documentation itself are made and put to use. Contributors work as teams and all works are edited by an editing specialist. The transition required from Level 3 to Level 4 occurs when the project management continuously succeeds in keeping projects under control, and the team members start to trust the process.

The above descriptions of the four levels are considered when assessing the maturity of the current documentation process of the target company. After the maturity of the process has been determined, the following level is set as a goal for improving the documentation process, and the changes required in moving to another level are taken into account when making improvement suggestions.

3.3.2 The target company's process flow diagram

The target company has a process flow diagram for producing manuals, as can be seen in Appendix 1. The diagram presents the roles of different employees and departments[1], and the tasks which are expected to be performed when producing the documentation: while the

[1] The target company comprises three departments: product development, production, and sales and marketing (Traineeship 2015), all of which participate in the documentation process according to the process flow diagram (Appendix 1).

production of the Finnish version of the technical documentation is allocated to product development, marketing and sales takes care of translation and printing by contacting the outside translation vendors and the printing house. Finally, production orders the required number of technical documentation.

The very existence of a process flow diagram for producing manuals indicates that producing technical documentation is regarded as a process. However, the diagram (Appendix 1) only presents an overview of the process and does not include specific activities related to the production of the content of the technical documentation: it states that the product developers "compile and update the Finnish version of the manual" [my translation], but does not define how compiling and updating are carried out. Therefore, in this study I explore the activities the product developers perform when producing content for the technical documentation and identify possible issues hindering the actual process.

In addition to presenting only the overview of the documentation process, the process flow diagram (Appendix 1) states that "user manuals are handled as all the other purchasable components" [my translation]. The statement implies that, in principle, the target company considers the technical documentation as a part of a product and thus worth developing. Therefore, in addition to studying the documentation process of the target company, I investigate the actual status of technical communication in the company in order to determine how the prevailing status affects the documentation process, and how it might affect developing it in the future.

As discussed in subsection 3.3, the first phase in developing processes involves a current state analysis, which includes gathering information on the current process and illustrating it in a model. Thus, the process flow diagram (Appendix 1) provides an excellent starting point for both developing the documentation process and determining the status of technical communication in the target company by illustrating the current process.

3.4 Development models

The new development model for the target company will be designed according to the development models of Hackos (1994), Haramundanis (1998), and Kister (2016) presented in subsections 3.4.1, 3.4.2, and 3.4.3. Finally, the most relevant features of the aforementioned models will be discussed in subsection 3.4.4.

3.4.1 Hackos' model

Hackos (1994, 28) bases her *publications-development life cycle* on several common product development models. Thus, as Hackos explains, the model coheres well with models being applied for the product development process. Hackos' development model consists of five phases, as shown in Diagram 3.

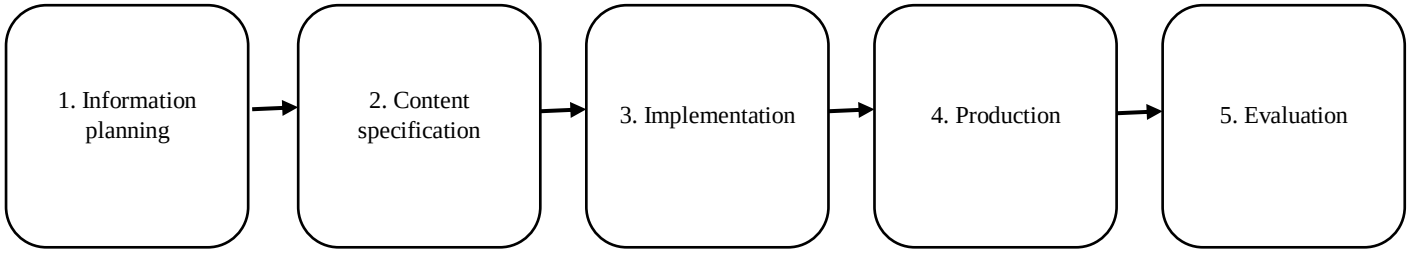

Diagram 3. Hackos' development model (applied from Hackos 1994, 29)

Information planning. Phase 1 in Hackos' (1994, 29–33) development model comprehends an initial investigation on the requirements of the documentation project and the estimation of resources required in the project. Investigating the requirements of the project involves researching information on the users of the documentation and their goals and tasks in using the documentation, the environment in which the documentation will be used, and the nature of the product to be documented. The information gathered will be used to compile an information plan, which includes an outline of the information needed by the users and the company. Phase 1 also includes estimating the resources such as time, milestone schedule, deliverables, team members, and assessment of risk factors, which are compiled into the project plan required for the implementation of the information plan. Hackos emphasises that both deliverables are required as one would not be useful without the other. At the end of Phase 1, a phase review is held in which all interested parties, such as those making decisions on the resources, either approve the plans or request modifications to them.

Content specification. Phase 2 in Hackos' (1994, 33–34) development model involves adding details to the plans that have been compiled and approved for implementation in the previous phase. There are two deliverables in Phase 2: a content specification and a revised project plan. In this phase, the technical communicator investigates the product and its use as well as the users of the product and their goals thoroughly to produce the content specification. The content specification includes detailed information on the product and its

users as well as an outline of the topics for the documentation. Hackos explains that if the research is sufficiently thorough, and the content is not altered dramatically during the project, there should be little deviation at the end of the project from the original table of contents.

As more detailed information on the project has been gathered to produce the content specification, and the scope of the project thus might have changed, the initial project plan has to be revised in Phase 2. After compiling the content specification and updating the project plan, a phase review is held where the plan is approved or modifications to the deliverables are requested.

Implementation. Phase 3 in Hackos' (1994, 34–36) development model contains the design and the development of the documentation. This phase features several deliverables as multiple versions of documentation are frequently produced to be reviewed and modified. In addition to documentation-related deliverables, Hackos lists project manager's project-related deliverables such as progress reports and tracking spreadsheets. Hackos emphasises the role of the project manager who is responsible for tracking the project's progress to ensure that the project remains on schedule and within budget. The manager is supposed to evaluate any deviations from the schedule and budget, and inform the project team of any changes to the scope, schedule, and budget. Because of many deliverables, several phase reviews occur in Phase 3.

Production. Phase 4 in Hackos' (1994, 36–37) development model includes the activities required to deliver the final version of the documentation to the user of the product. These activities might include preparing, translating, and localising the final version, and printing, binding, and packaging hardcopies of the version. Furthermore, the phase might include preparing electronic forms of delivery and assembling the documentation for distribution to the users. As many of these activities are typically performed outside the company, this phase requires a considerable collaboration with outside vendors. Hackos explains that as these types of activities are typically inflexible, it is difficult to substantially shorten the time required for this phase. Planning the documentation project and estimating all other activities in relationship to the needs of the production phase is thus required in order to control the project.

Evaluation. Phase 5 in Hackos' (1994, 37) development model involves two important activities performed by the project manager: evaluating the current project and planning for the next version of the project. Moreover, the project manager is required to produce several deliverables together with the team members: a project wrap-up report for the company, team and individual project-specific evaluations as well as project manager self-evaluation. These activities should be performed as early as possible so that the details are not forgotten and the response to opportunities for improvement is rapid.

3.4.2 Haramundanis' model

Haramundanis (1998, 80) introduces her development model as *the quality documentation process* that has been successfully applied in producing high-quality technical documentation. Haramundanis' development model includes six phases, as presented in Diagram 4.

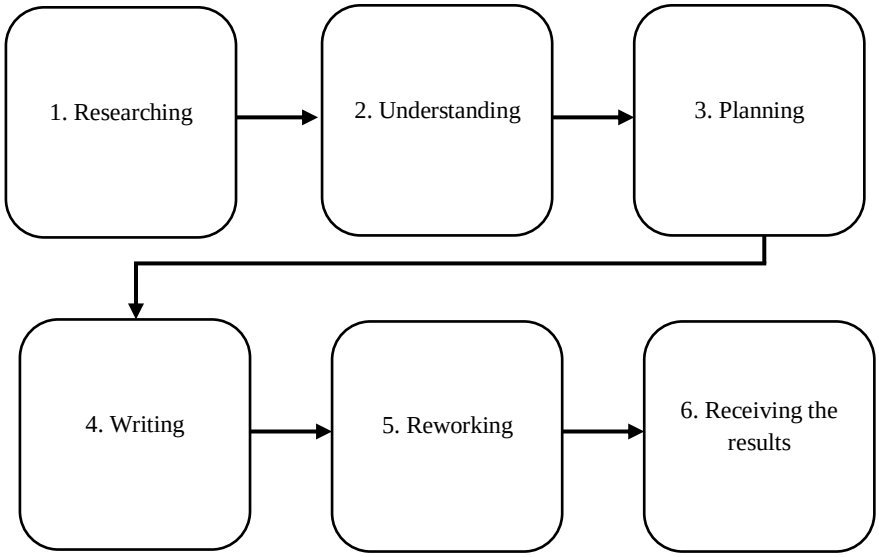

Diagram 4. Haramundanis' development model (applied from Haramundanis 1998, 79–80)

Researching. Phase 1 in Haramundanis' (1998, 80–81) development model includes studying functional specifications, design information, library materials, and other written materials. The information sources also include discussions with product developers and meetings held during the project. This phase also contains studying the potential target users of the documentation, using the product, experimenting with different ways of documenting, and making the documentation accessible to the users. In her development model, Haramundanis stresses the importance of researching information both at the beginning and throughout the

documentation process. According to her, it will be impossible to complete the project if research is neglected.

Understanding. In Phase 2 in Haramundanis' (1998, 81–87) development model, the project team has a fairly complete view of the project, the product, and the needs of the market and the users. This phase affects the success of the following phase. According to Haramundanis, experienced technical communicators develop conceptual techniques to understand and explain particularly difficult, complex, or intractable problems or products, and they find ways to organise material even when there are still many unknowns. These techniques include brainstorming, decomposition, metaphor, mapping, and modelling.

Planning. Phase 3 in Haramundanis' (1998, 87–92) development model involves planning. Haramundanis explains that planning is essential to accurate scheduling and producing deliverables on time. In Phase 3, the project manager typically creates a documentation plan, which contains at least an outline and a schedule. While both plans are liable to change, they assist in producing the material on time.

Writing. Phase 4 in Haramundanis' (1998, 92–95) development model includes starting the production of the technical documentation. During this phase, the research material gathered in Phase 1 is utilised in gathering information by conversing and collaborating with the product developers and testing the product being documented. The three previous phases are thus continued. Haramundanis points out that creating technical documentation efficiently requires proficiency with the tools being used in documenting and knowledge of ancillary tools that the illustrators use so that the technical communicator will be able to describe the illustrator what is needed in the documentation. The deliverable of this phase is a draft of the documentation.

Reworking. Phase 5 in Haramundanis' (1998, 95–113) development model includes the testing of the draft created in the previous phase. The testing involves a review by the product developers of the team, peer writers, management, representative of a translation team, and an editor. Phase 5 also includes usability testing of the documentation. Moreover, the product developers are supposed to examine the technical content of the documentation for its accuracy, completeness, and appropriateness. Haramundanis states that documentation project teams should always include an editor. The editor's duties involve producing a style sheet or a style guide that includes the conventions applied throughout the technical documentation.

Furthermore, similarly to Nickl's proposition for four editing phases discussed in subsection 2.4, Haramundanis states that the editor should read a draft three times: for grammar and punctuation, adherence to style guide, and typographical errors. According to Haramundanis, technical documentation usually receives an optimum number of reviews when the project includes three drafts.

Receiving the results. Phase 6 in Haramundanis' (1998, 113–114) development model includes only receiving the documentation material in a printed or electronic form, which, according to Haramundanis, generates a feeling of achievement and satisfaction at the end of the project.

3.4.3 Kister's model

Kister (2016) presents *a refined iterative development model* as a model that can be used to improve processes related to information development. According to Kister, the model contributes to achieving business goals, such as increased productivity and overall profit. Kister bases her model on the results of her analysis in which she studied the common characteristics and phases of over 50 information development models of different industries. The analysed development models were non-scholarly, because, according to Kister, organisations are more likely to apply models easily found in the mass media instead of academic sources. The nine phases and three types of iteration of Kister's development model are shown in Diagram 5.

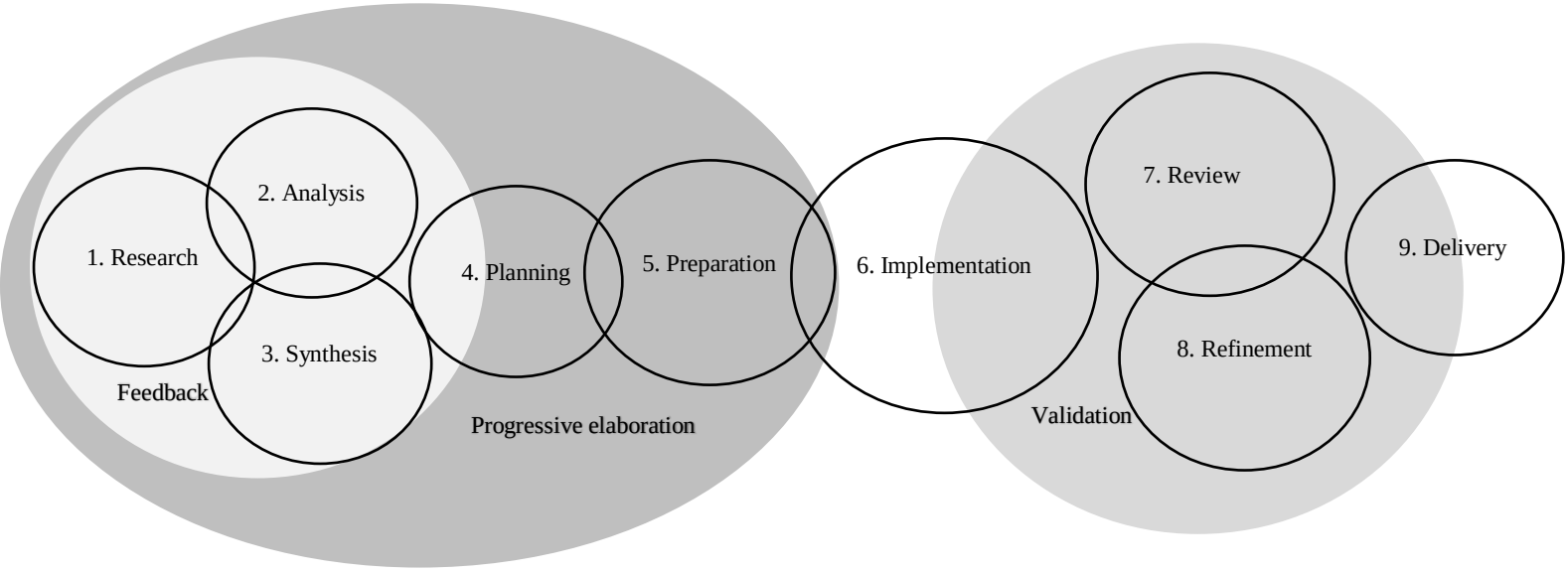

Diagram 5. Kister's development model (Kister 2016, 199)

Research. Phase 1 in Kister's (2016, 201) development model includes gathering all available information on the project. Kister explains that information can be gathered from official sources such as existing documentation, interviews with product developers and customers, usability tests, customer support, and marketing departments within the company. She adds that unofficial sources such as training aids and online forums related to the product or the service can be valuable sources of information. Deliverables of this phase include repositories of content, a list of resources and potential information categories as well as a research report summarising the progress to date, required information, and research goals.

Analysis. Phase 2 in Kister's (2016, 201–202) development model involves classifying, sorting, and verifying the information gathered in the previous phase. The gathered information is reviewed in detail and organised into, for example, topics, learning objectives, or information types. Additionally, the accuracy of the information is verified by testing the existing documentation against the product or the service. Deliverables in this phase include a research report, a refined list of information categories, and flow charts depicting user workflows.

Synthesis. Phase 3 in Kister's (2016, 202) development model involves "combining elements together to form something new". Kister explains that this phase is related to *design thinking*, "a solution-based, creative approach that emphasizes empathy and user-centeredness, reframing all possibilities, and prototyping". In practice, this phase includes researching every possible method that can be applied when producing technical documentation. Additionally, tools such as new technologies and media that can be used for production and delivery are researched in this phase. Possible deliverables in this phase include a report of advantages and disadvantages of the methods and the tools considered, a general plan for implementing the recommended approach, and a description of the technical documentation to be produced.

Planning. Phase 4 in Kister's (2016, 202–203) development model involves defining project goals and general criteria for success, formulating a structure of the technical documentation, and developing a work breakdown structure. Kister argues that defining goals and criteria for success contributes to decision-making, because the consequences of each decision can be evaluated against the defined goals and criteria in the following phases. Moreover, the formulated structure of the technical documentation can be used as a work breakdown structure to divide the project into manageable components, which facilitates meeting deadlines. For example, the table of contents of a user manual can be used as the structure,

and the topics within the table of contents can be designated as the components. In this phase, deliverables can include an outline of topics, a work breakdown structure, a project schedule, a list of topics to be included in the technical documentation, and a contingency plan.

Preparation. Phase 5 in Kister's (2016, 203–204) development model involves developing tools such as style guidelines, templates, and terminology lists to be used in the following phases. According to Kister, this phase is critical in terms of quality, because clearly documented standards facilitate assessing whether the technical documentation conforms to quality requirements. Furthermore, as the tools are developed together in the same phase, they will be consistent, which, in turn, facilitates maintaining the consistency of the technical documentation. Kister believes that the time invested in developing tools saves time in the following phases. Deliverables in this phase include customised style guidelines, templates, terminology lists, and guidelines for quality and quality assurance processes.

Implementation. Phase 6 in Kister's (2016, 204) development model includes producing the technical documentation, and refining the tools and the standards if needed. According to Kister, the technical documentation can be produced more efficiently if the tools have been prepared in the previous phase. Possible deliverables in this phase include a version of the technical documentation and the refined tools.

Review. Phase 7 in Kister's (2016, 204–205) development model involves testing, validation, and quality assurance. In this phase, the standards and the tools are used to assess the quality of the technical documentation, which is why Kister emphasises the importance of developing them in Phase 5: if the standards and the tools have been developed accordingly, reviewing can be carried out quickly. Deliverables include review comments, approvals, recommendation for improving the tools, and the refined tools.

Refinement. Phase 8 in Kister's (2016, 205) development model includes correcting the defects in the technical documentation in accordance to the standards and the tools. Additionally, in this phase, the usefulness of the standards, the tools, and the review processes are evaluated, and possible recommendations for improving them are provided. In this phase, the deliverable is the final version of the technical documentation.

Delivery. Phase 9 in Kister's (2016, 205–206) development model indicates the end of the project. Kister explains that a phase indicating the end of the project defines a clear goal for the parties. This phase also includes carrying out activities specific to ending the project such

as delivering the finished technical documentation, documenting lessons learned, and obtaining approval for the final version of the documentation. In this phase, it is also possible to gather information on areas of improvement in the technical documentation and the development process. Possible deliverables include the final version of the technical documentation, acceptance documents, lessons learned, and recommendations for improvement.

Progressive elaboration. Progressive elaboration is a form of iteration in Kister's (2016, 200) development model which refers to adding detail as more information becomes available. Kister explains that progressive elaboration is an ongoing process which occurs throughout the early phases of development. She adds that ideally this form of iteration is complete when all available information has been gathered before the Implementation phase.

Feedback. Feedback in Kister's (2016, 200) development model is a form of iteration which can provide new information for improving the project in progressive elaboration. Feedback includes collaborative refinement, which occurs throughout the project, especially in transitions between two phases. Kister lists meetings, informal conversations, online forums, usability tests, and comments in documentation as ways of receiving feedback.

Validation. Validation in Kister's (2016, 200) development model is a form of iteration which includes the Review and Refinement phases. Kister explains that these two phases are formal and systematic in nature, and are depicted as individual phases that interrelate with each other. While the Review phase includes evaluating the version of the technical documentation against the guidelines and the standards, the Refinement phase refers to carrying out the changes proposed in the Review phase to align the technical documentation with the guidelines and the standards.

3.4.4 Comparing the models

In this subsection, I will compare the development models of Hackos (1994), Haramundanis (1998), and Kister (2016). As the models involve similar phases, the phases in the development models are grouped into three categories: planning, production, and delivery. Moreover, I will discuss the features that are emphasised in the models or that are supposedly important in this study, namely iteration, process management, and quality assurance. The findings of the comparison are applied to form the new development model and suggestions for improvements in Chapter 6.

Planning. The first phases in each development model can be categorised as planning phases. In Hackos' development model, the first phases include researching information on the project and the product, and producing plans for the project and the technical documentation. While Haramundanis' and Kister's models include researching information on the product and the project, as well as developing plans, they also include other activities related to preparation of the project: both Haramundanis' and Kister's models involve analysing and organising the gathered information as well as preparing ways for documenting and delivering the technical documentation.

Production. All of the development models include phases categorised as production phases which involve writing, reviewing, and modifying the technical documentation. Hackos' model includes two production phases: first phase involves writing, reviewing, and modifying multiple versions of technical documentation, while the second phase involves activities such as binding, translating, and printing of the final version of the technical documentation. Hackos stresses the importance of taking into account phases such as translation and printing, because they are often performed by outside vendors, which is why the activities do not necessarily respond well to changes, and it is difficult to shorten the time required for them. Haramundanis' model also includes two production phases, of which the first phase involves writing a version of the technical documentation, and the second phase reviewing and modifying the version. However, unlike Hackos' model, Haramundanis' and Kister's models do not take into account other processes, such as translation or printing. Kister's model, on the other hand, includes three separate production phases, in which a version of the technical documentation is written, reviewed, and refined. Additionally, in Kister's model, the tools used in documenting are modified during production phases if necessary.

Delivery. The final phase in the development models indicates the end of the documentation project. In Kister's model, the final phase involves delivering the final version of the technical documentation as well as evaluating the project. The final phase in Hackos' model involves only evaluating the project and planning the next project, because the previous production phase involved delivering the technical documentation. Haramundanis' model, on the other hand, does not include delivering the technical documentation. Rather, the final phase involves receiving the technical documentation in a printed or electronic form, which creates a feeling a satisfaction among the technical communicators.

Iteration. All of the development models include some form of iteration, but Kister's model clearly defines and visually depicts them. Kister's development model includes three forms of iteration, of which two forms, progressive elaboration and feedback, are carried out during the planning phases. Kister explains that, because most of the information becomes available progressively, it is necessary to elaborate the plans when new information is discovered. Progressive elaboration can be performed by the method of feedback because it is one way to receive new information. The third form of iteration, validation, occurs during the production phases and depicts the interrelation between two phases, Review and Refinement.

Although iteration is discussed further only in Kister's development model, forms of iteration can also be found in Hackos' and Haramundanis' development models. Moreover, these forms are related to similar activities as in Kister's model: researching information and producing drafts. For example, Haramundanis' model mentions gathering information throughout the project, while plans are drafted and specified during the two planning phases in Hackos' model. Moreover, in the production phases in both Hackos' and Haramundanis' models, drafts of technical documentation are produced, reviewed, and modified.

Project management. The development models include activities, such as planning, managing, and evaluating, related to project management. The role of the project manager is clearly emphasised in Hackos' model: according to Hackos' model, the project manager is responsible for tracking the progress, so that the project remains on schedule and within budget. Additionally, Hackos' model places importance on the collaboration of the manager and the team during the project. Similarly, Haramundanis' model mentions a project manager, who makes plans for both the technical documentation and the project. Kister, on the other hand, does not mention any person responsible for managing the project, but some of the deliverables in the model, such as various reports can be seen as tools for managing the project.

Quality assurance. All of the development models include activities such as reviewing and modifying the versions of technical documentation, which contribute to quality assurance. Moreover, Kister's model includes a phase for preparing tools, such as style guidelines and templates, which are used when reviewing versions. This contributes to a quick review process and quality in technical documentation. Haramundanis' model mentions in detail different parties, such as product developers, translators, and editors that participate in reviewing: the technical content is reviewed by product developers, while an editor

concentrates on the language use in the technical documentation. Haramundanis' model stresses the importance of an editor in the project team and explains that the process should include three editing phases. The idea of several editing phases has also been voiced by Nickl who suggests that each phase should focus on different factors of quality, as discussed in subsection 2.4.

4 Research method and data

In this chapter, I will discuss interview as a research method, the interview questions formulated for this study, the interview process itself, and the analysis of the data.

4.1 Interview method

The study at hand is a qualitative case study, and it is conducted by the method of a semi-structured interview. As the aims of this thesis include studying the current documentation process and its improvement areas as well as the status of technical communication in the target company, interviewing the employees participating in the documentation process is more than an appropriate method to gather information for the research questions.

Janice Morse (2012, 197) defines a semi-structured interview as an interview consisting of question stems to which the interviewees can response freely. According to Morse, the semi-structured interview is used when the researcher has some information on the topic of the research but cannot anticipate all the answers. Furthermore, she explains that semi-structured interviews may consist of probing questions, which are either planned or arise from the responses of the interviewee. Morse emphasises the importance of pretesting because according to her, the questions of a semi-structured interview cannot be changed once the interviewing process has begun. Moreover, she adds that questions are asked of all interviewees in the same order.

As I had gained some information on the topic during my traineeship but was not aware of the nature of the current documentation process of the target company, the semi-structured interview was an appropriate method for the study at hand. During the interviews, I used probing questions to ensure that I had understood the response correctly or to obtain further information on the response. However, although Morse explains that the study questions cannot be changed once the interviewing process has begun, in this case study, it was necessary to modify the interview questions in the interview situation to adapt them to the point of view of the interviewee. For example, some of the interviewees had little experience in previous documentation projects at the target company, which is why asking about the effects of the problems in documentation projects to the interviewee's own working tasks was irrelevant.

4.2 Interview questions

The interview questions include 30 questions, and they fall into four categories: background information, documentation process and quality, developing the documentation process, and other comments (Appendix 2).

- **Background information.** The questions related to background information were placed at the beginning of the interviews. Their aim was to gather information on the interviewees' background, such as main work tasks, the number of years at the company, documentation related tasks, experience in documentation tasks, possible training in technical communication, and interest in receiving training in technical communication. Answers to these questions determined whether the following interview questions were asked or modified according to the interviewees' point of view.

- **Documentation process and quality.** The questions related to the documentation process and quality gathered information on the interviewees' views on the objectives and importance of the documentation process, phases and issues in the documentation projects, relationship between the documentation process and the product development process as well as the quality of the technical documentation. Furthermore, this theme included questions on project X, because it was the latest documentation project carried out in the target company and thus fresh in the memory of the interviewees. The main aim of this category was to obtain information on the current documentation process and the possible issues related to it.

- **Developing the documentation process.** The questions related to the development of the documentation process gathered interviewees' suggestions for improving the current documentation process as well as information on their interest in participating in developing the process. The main aim of this category was to obtain information on how the current documentation process should be improved.

- **Other comments.** This category ended the interview by giving opportunity for the interviewees to voice ideas that had arisen during the interview.

Although the interview questions are grouped under specific categories, they do not aim to probe only behind the topics of the categories. For example, questions related to status were

placed in all of the categories: question “In your opinion, how important are the documentation related tasks in comparison to your other tasks” was placed in the *Background information* category, while the *Documentation process and quality* category included a question about the importance of technical documentation to the company. Moreover, some of the questions provide information on more than one theme. For instance, the question “How would you define quality technical documentation?” could yield information on both the quality of technical documentation and the status of technical communication in the company.

4.3 Interview process

The interview process started two weeks prior to the interviews when I sent a cover letter to the interviewees. I sent the letter to six employees, who worked either in product development or marketing and sales, and who I had met during my traineeship. The cover letter specified the date and time of the interview, the topic and aims of the study, the estimated duration of the interview, recording of the interview, the anonymity and confidentiality of the answers, the estimated publishing time of the study, and the place of publishing. The interviews themselves were conducted face-to-face at the premises of target company on the 15th–17th of February 2016. At the beginning of each interview, I informed the interviewees on the same matters that the cover letter had included. I also told the interviewees about the topics to be discussed in the interview and the possibility to contact me after the interview, if necessary.

I conducted five interviews in total. The first interview was a pilot interview in which I tested the interview questions (Appendix 2). After the pilot interview, I modified the questions only by adding a definition for technical documentation [tekninen dokumentaatio] which explained that in this study, technical documentation refers to user manuals and spare parts catalogues. This was to focus the interviewees’ attention only on user manuals and spare parts catalogues, because at the target company, technical documentation is also seen to include other material, such as assembly instructions used in production. Defining technical documentation was thus necessary as I required information only on the production of user manuals and spare parts catalogues. Although the first interview was a pilot interview, the answers of the interviewee are included in the data of this study.

The interviews lasted from 30 to 50 minutes, and they were recorded and transcribed. The pilot interview was written down on the same day to detect whether any questions had to be modified, while the rest of the interviews were transcribed after all of them had been carried

out. I wrote the transcriptions down word by word but did not focus on the wordings in detail, because the language use of the interviewees was not the centre of attention in this study.

4.4 Analysis of the data

The data of this study consists of five transcribed interviews. I started the analysis of the data by studying the interviews to decide the best way to classify the answers. As the interviewees' answers varied, and some of the answers to the interview questions overlapped with the answers to other questions, I decided to classify the data according to themes instead of the interview questions. Therefore, the analysis in Chapter 5 is constructed according to the themes that reoccurred in the interviews, and specific questions are not discussed.

To describe the themes in the analysis, I have added quotes in the analysis as examples of the answers. The quotes are translated into English, because the interviews were conducted and transcribed in Finnish. Moreover, as the number of the interviewees is small, all of the answers are equally important to this study.

The interviewees all either had participated in documentation projects in the past or were going to participate in them in the future. However, because of the small number of the interviewees, I will not discuss answers to questions in the *Background information* category, such as main tasks, in much detail. This is to protect the anonymity and confidentiality of the interviewees. When discussing an answer of a specific interviewee, I will refer to them with letters A, B, C, D, and E.

5 Results and discussion

In this chapter, I will present the results of the interviews. The results are categorised according to the themes arising from the data, and the subsections are named accordingly. Although each subsection focuses on one theme, the subsections touch upon themes of other subsections, because there is some overlap between the themes. The themes I will discuss in the subsections comprise organisational boundaries, the phases in the process, available resources, motivation for the documentation tasks, quality of the technical documentation, and the role of process management in the documentation process.

5.1 Organisational boundaries

The current documentation process at the target company crosses organisational boundaries: product development produces the primary version of the technical documentation in Finnish, and sales and marketing decides on the necessary translations and sends the technical documentation to the translation vendors and the printing house. Finally, production orders the necessary number of technical documents when needed. This overview of the departments participating in the documentation process was mentioned by all of the interviewees, and this is also the overview given by the process flow diagram of the target company (Appendix 1).

Product development is the department at the target company that has the most influential role in the documentation process, as it produces the primary version of the technical documentation. Moreover, it is only natural that product development is responsible for the documentation process, because the product developers "know the technical features of the machine and how the machine should be used", as described by interviewee C.

When discussing the relationship between the documentation process and the product development process, all of the interviewees mentioned that the production of new technical documentation starts at the end of the product development process after the machine has been designed. Two of the interviewees explained that the two processes do not fit together because of a lack of resources:

> (Interviewee A) The problem is the lack of resources, and that's why the documentation process comes so far behind. The process we have has been created when we had three times more people at work, but now the situation is different and it just doesn't work.
>
> (Interviewee B) With the resources we have at hand we have to design the machine first, and then at the end we produce the user manual. We don't have a choice because we don't have the resources.

The responses of interviewees A and B indicate that the technical documentation has to be produced at the end of the product development process because of the limited number of employees. However, while interviewee B says that the current method is the only way the technical documentation can be produced with the resources at hand, interviewee A considers the documentation process to be outdated and not modified to the current needs of the company. In addition to mentioning the decrease in the number of employees as the reason why the processes do not fit together, the difference between the comments indicate that there are different views on the possibility to develop the documentation process in the future.

Another reason for the late start of the documentation process is the uncertainty of the success of the development project, as discussed by interviewee D:

> (Interviewee D) At first we have to finish designing the machine X and then test it in practice so that it works. Then we have to decide to take it into production, and that's when we start writing the user manual.

Using project X as an example, interviewee D explains that before starting the documentation process, it has to be ensured that the machine actually works. Interviewee D explains further that because the machine does not always work as expected, the documentation is not produced. This indicates that allocating resources to the technical documentation is not seen to be useful, because there is a possibility that the product will not be produced and sold.

5.2 Phases in the process

All of the interviewees' responses indicate that they are aware of the overall documentation process, because they explain the main work tasks of each department involved in the process. However, the activities regarding the production of the primary version of the technical documentation does not seem to be clear for all of the interviewees, as can be seen in some answers to the question "What phases does the production of technical documentation include?":

> (Interviewee A) First we create the design of the content and how it'll be presented in the manual, and decide who'll prepare which part of the manual. When the text exists, we check whether the text, the graphics, and the diagrams suffice. Then we start to prepare everything so that it'll be readable. It's difficult to say, I haven't thought about it before.

Although interviewee A describes the phases to include planning the documentation project, producing the content as well as reviewing and revising it, the interviewee mentions not having thought of the phases before. Moreover, two of the interviewees answered the question by discussing the content presented in the technical documentation:

> (Interviewee C) I'm not sure how to answer this, I have to think about it…Well, at first there are warnings, then how the machine works and then how the machine is prepared for use and then there's information on how the machine should be maintained.
>
> (Interviewee D) We made a template for the user manual in the past and we use that same template. We start by making the table of contents, describing how the machine should be prepared for the use, then there are the warnings and the use of the machine, and then there's the maintenance of the machine and finally how it's recycled.

In their answers, interviewees C and D list the different chapters of the template for the user manuals. These answers imply that the chapters of the template are seen as phases of the documentation process, and that there are no other phases in the process. The template was mentioned by all of the product developers during the interviews, and it seems that from their point of view, the documentation process is largely dependent on it.

The template seems to be a ready-made plan for all of the technical documentation, and it is used as a starting point in every documentation project. The documentation process starts with the template and a consideration of whether the product developers "can draw on the existing content", as described by interviewee B. The interviewee further notes that after producing the information on the use of the machine being documented, the first version of the technical documentation is reviewed and possibly tested by users:

> (Interviewee B) When the manual is finished, it will be reviewed by two to three persons. Sometimes we have had trainees to perform some function in the user manual with the machine and if they hadn't understood something [in the manual], we have revised the instructions. It is a really effective method.

Although interviewee B describes user testing as being effective, it is not a usual part of the process. Moreover, interviewee E's response contradicts interviewee B's answer, as Interviewee E says that after the product developer has prepared the user manual by using the template, "the user manual has not been reviewed or proofread, rather it has been forwarded to translation and print". Reviewing as a phase does not always occur in the documentation projects, or all of the product developers are not aware of such phase taking place. This can be explained by interviewees' different amount of participation in documentation projects.

Forwarding the technical documentation to translation and print, as described by interviewee E, represents the interviewees' notion of the documentation process at the target company: when considering the phases in the documentation process, the interviewees either mentioned translation and print briefly or did not mention them at all. It seems that translation and print are not recognised as integral phases of the process, because they are coordinated by the sales and marketing department and performed by outside vendors. This kind of view can cause

problems as translations have become even more important, because the export of the machines has become a significant part of the business, as mentioned by interviewee B.

5.3 Resources

During the interviews, the interviewees mentioned resources such as the number of employees, the experience of the employees in producing documentation, and time to be factors affecting the documentation process. For instance, according to three of the interviewees, the limited number of employees was the reason why project X did not follow the established process: the product developer responsible for the machine did not produce the technical documentation, and the final version of the technical documentation was completed by two trainees. Moreover, two of the interviewees mentioned that because of the limited number of employees in product development, the product developers are expected to be able to perform different kinds of work tasks. Therefore, some of the work tasks, such as documentation tasks, are likely to be outside the core competencies of the employees.

Although the product developers produce the primary version of the technical documentation, previous training in producing documentation seems to only focus on documentation tools. When asked whether they have had any training in producing technical documentation, four of the interviewees' responses focused only on having formal training in the use of documentation tools. However, three of the interviewees emphasised having learned to use the tools mostly in practice with the help of their colleagues. Two of the three interviewees' responses also indicate that as they had learned to use CorelDraw in practice, they expect to learn to use InDesign thoroughly during future documentation projects.

While previous training has mainly concentrated on tools, some of the interviewees would want training in the content required in technical documentation. When asked what kind of training should be arranged in the future, training in InDesign was mentioned by four of the interviewees, while the requirements of technical documentation were mentioned by three of the interviewees. However, responses of two of the interviewees indicate that the product developers have participated in CE marking courses, which, according to the interviewees, provide enough information on producing technical documentation that would conform to the standards, especially with regard of the content of the technical documentation.

In addition to employees and their experience in producing technical documentation, time was one of the resources brought up by the interviewees. According to the interviewees, one of the

aims of project X was delivering the technical documentation to the customer together with the machine, so that it would not have to be sent to the customer afterwards. As the interviews were conducted a year after the documentation project, three of the interviewees were not sure whether the technical documentation was delivered with the first machines. However, according to two of the interviewees, the first version of the technical documentation was delivered on time with the machine, but the aim of the project was not entirely achieved, as can be seen in interviewee A's response:

> (Interviewee A) Time target. The manual should have been with the machine when it was delivered. When the first ones [the machines] left, they [the user manuals] didn't represent us the way they should have.

Interviewee A's comment indicates that the aim of project X was only partly achieved, because the first version of the technical documentation did not represent the quality criteria of the target company. Therefore, it is not a surprise that the lack of time was mentioned as the main problem in the project, which caused the need to produce the documentation in a hurry.

In the past, the target company has solved the lack of time by hiring outside vendors to produce the technical documentation. However, according to interviewee B, this solution has usually not been a functional one:

> (Interviewee B) We have used outside vendors some time when we were really busy, but we feel that it ties us quite a lot. They [outside vendors] do make the spare parts catalogues quite efficiently, but the user manuals…When producing content, you have to know the product in some way to be able to instruct the end user. It [using outside vendors] has tied our resources quite a lot.

Interviewee B sees that while outside vendors were able to produce technical documentation effectively, they tied the company's resources too much because they needed consultation on the product and its use. Therefore, hiring outside vendors has not solved the problem of limited time. Interviewee B explains the situation further:

> (Interviewee B) We had to arrange a few days briefing, and then there were calls coming in every day throughout the project. When you're designing a product intensively, and you get a call and spend half an hour until you can continue, and then you start to think what you were doing earlier. We wanted to get rid of that and thought it would have been faster to do it ourselves.

Interviewee B's comment indicates that choosing an outside vendor to produce the documentation was a bad decision, because the vendor required consultation from the product development team frequently. However, the company also has good experiences of the services of outside vendors: the interviewee also mentions that the company has used an

outside vendor whose employee had previously worked at the target company and thus knew the products to be documented. Therefore, according to the interviewee, an outside vendor who knows the product would be more useful, because it does not tie the target company's resources by requiring information from the product development team.

The target company has used outside vendors in other documentation tasks as well: in addition to translating and printing, preparing layout has been a phase performed by an outside vendor in the past. However, according to interviewee A, using an outside vendor has not been effective, because marketing and sales has had to provide information for the vendor who does not have knowledge and experience in the field. Therefore, marketing and sales has recently obtained skills in preparing the layout for customer documentation, and tasks relating to it will be done at the target company in the future.

As mentioned earlier, project X did not follow the established documentation process, because the technical documentation was completed by two trainees. Employing trainees or other resources for documentation projects is also seen possible in future projects, as discussed by interviewee C:

> (Interviewee C) Do we use the product developer or do we employ, to put it bluntly, a less expensive resource, and allocate the competent and eager developer to some other creative work instead.

According to interviewee C, the product developers could be allocated to development work, while other resources, such as trainees, could produce the technical documentation. While interviewee C considers the possibility of outside resources, the interviewee also mentions that in any case, the product development team should have the skills and the knowledge to produce the technical documentation, even if it was not always done by the product developers. However, interviewee C's answer implies that product developers' time is regarded as too valuable for documentation tasks, which is why other resources are considered when developing the documentation process in the future despite the difficulties that occurred earlier with outside vendors.

5.4 Motivation for producing technical documentation

One of the themes arising from the data is the motivation of the employees to do documentation tasks. Three of the interviewees imply that documentation as a task is not a top priority for the product developers, and two mention that creating content is not that easy for the product developers, because it is not one of their primary work tasks. Interviewee E sees

the lack of interest in documentation tasks as one of the problems in the documentation process:

> (Interviewee E) I do think it's a problem that it [the documentation] is some sort of a necessary evil, so how good it's going to be then...

According to interviewee E, the lack of motivation for documenting may influence the quality of the technical documentation. Interviewee D's comment on documentation supports this notion, as the interviewee describes documentation using the exact same expression as interviewee E to be "a necessary evil" in which the product developers do not invest too much. To motivate the product developers on the importance of producing technical documentation, two of the interviewees call for a change in the mindset:

> (Interviewee E) We should regard the user manual as one of the parts which we buy in a printed form. We have designed and developed the content ourselves so it isn't any different from ordering some part from subcontractors when someone translates and prints [the technical documentation], but now it's somehow considered difficult.
>
> (Interviewee C) It [technical documentation] has to be integrated in the product. We have to think that we can't finish the product or that the product isn't finished. It can't go into mass production until the documentation is done.

According to interviewees E and C, the product developers should consider the technical documentation as a part of the product, which has to be completed before mass production begins. Furthermore, interviewee C adds that "the documents have to be more than drafts" when they are delivered to the customer, which indicates that the quality of the technical documentation should be taken into account more in the company.

Even if the employees would regard the technical documentation as an inherent part of the product, they might not consider the documentation tasks to be interesting. This can be seen in interviewee C's comment which indicates that a product developer's skills could be utilised more effectively elsewhere:

> (Interviewee C) For the product development team, producing documentation is not that creative work. Product developers are very creative up until mass production, they come up with solutions and use their brains efficiently, and if there is a couple of month's documentation project in the end, the developers are not at their best because it is very repetitious work.

Interviewee C finds that the product developers' contribution would be more worthwhile in development work than in the documentation tasks. However, interviewee B says that "compiling a user manual has never been unpleasant for me, it's one of my varied work tasks". Additionally, although the interviewees' answers implied that the employees are not very interested in the documentation tasks, all of the interviewees agreed that the technical

documentation is important for both the customer and the company, as can be seen in interviewee A's answer:

> (Interviewee A) To my mind, there's two main reasons why we produce documentation: the manual gives the user information on the machine so that the user is able to use it accordingly and doesn't break it. And secondly, the user doesn't harm himself, that is, the manual provides us with legal protection.

As discussed by interviewee A, the technical documentation provides the users with information on the machine and its use, and provides the company with legal protection against possible lawsuits from users who have harmed themselves while using the machine. These were the reasons mentioned by all of the interviewees when they were asked reasons for producing technical documentation.

Although the documentation tasks are not generally considered to be interesting in the target company, all of the interviewees expressed their interest in participating in developing the documentation process. Two interviewees even pointed out that developing processes is part of developing products, and as product developers, they are interested in improving "everything", as described by interviewee D.

However, although the employees would participate in developing the process, it seems that not all understand the reason for improving it by changing tools, as can be seen in interviewee B's comment:

> (Interviewee B) We would've wanted to keep it [CorelDraw], but I don't know why we had to change it to a program we don't know how to use.

Interviewee B's comment indicates that the employees have not been adequately informed of the change in tools, which is why they do not understand the advantages and the disadvantages of the new documentation tool.

5.5 Quality of technical documentation

The quality of the technical documentation was regarded as the key feature affecting the work of the employees, as mentioned by interviewee B:

> (Interviewee B) Firstly, the regulations require it and secondly, the manual should be as good as possible so that it reduces the number of customer calls to us.

While stressing the regulatory reasons for producing documentation, interviewee B also mentions that the quality of the documentation influences whether or not the employees have to spend much time on informing the customers on the use of the product after delivery. In

addition, interviewee E feels that customer calls result from a complicated product or technical documentation that is either poor or not read by the users. Interviewee E says that the product development "burdens itself" with customer support tasks by not succeeding in developing an easy-to-use product and user manual. Interviewee E sees that producing technical documentation is beneficial for the employees themselves, as the information is in a documented form.

Quality technical documentation also contributes to marketing: three of the interviewees mentioned the marketing aspect of the technical documentation to be an important reason for producing user manuals and spare parts catalogues, as discussed by interviewees A and C:

> (Interviewee A) If the machine has to be changed at some point, I believe that if this [the documentation] has been good, the company's machine will remain on the customer's list of future possible machines. So the user feels that the manual brings additional value to the machine.
>
> (Interviewee C) If we invest in the quality of user manuals and spare parts catalogues, they indicate [to the potential customer] that they belong to an effective and good machine.

According to both interviewees A and C, good technical documentation convinces the users of the quality of the company's machines. Moreover, the interviewees responses indicate that the marketing aspect of technical documentation is seen both affecting the impressions of potential customers of the machine's quality before it has been bought as well as encouraging the current customers to do business with the company in the future.

In addition to considering the quality of the technical documentation to be important for the company, the interviewees described the features of quality in technical documentation. For instance, all of the interviewees mentioned clarity and readability of the content as characteristics of quality technical documentation. Coherence between the technical documentation and the products was also mentioned by two interviewees. Moreover, two of the interviewees mentioned the importance of clear pictures in the technical documentation.

The interviewees regarded the use of standard language and the linguistic correctness of texts to be one of the factors affecting the clarity, readability, and coherence of the technical documentation. This can be seen in interviewee A's answer when considering the usual problems in the documentation projects:

> (Interviewee A) The people who make these [technical documentation] are engineers, who aren't really content creators. So there are a lot of dialect expressions and technical jargon, and we haven't revised the textual content so that it would be coherent and grammatically correct.

According to interviewee A, the technical documentation includes dialect expressions and technical jargon, which affect the quality of the technical documentation. The interviewee considers that the product developers' inexperience in producing content and the lack of revision to be the root causes of the problems in the technical documentation. The interviewee explains that these problems "come forth at some point, especially in the translation phase" when, for example, the translator has to investigate the meaning of a specific expression.

One of the features of quality technical documentation most often discussed in the interviews was information presented in the documentation. Specifically, four of the interviewees mentioned the need for presenting all the necessary information as a feature of quality technical documentation. Furthermore, it is seen as "an original sin", as described by interviewee B, of a product developer to include superfluous information that the user does not need. This was also one of the reasons for producing a new user manual as explained by interviewee E:

> (Interviewee E) It's one of the reasons why I wanted to make a new manual. They [the older user manuals] included things which weren't useful for the customer and failed to include things that the customer would have wanted to find.

According to interviewee E, the older technical documentation of the company not only provided information that was useless for the user, but it also did not provide information that the user would have needed. It seems that the user-centred approach prompted interest to improve the quality of technical documentation during project X.

5.6 Process management

Over the years, the situation at the company has changed regarding not only the number of employees, but also the number of products and especially the ways of developing them, as explained by interviewee B:

> (Interviewee B) When we had more products, we had a product developer for each product, but nowadays we do projects, so in practice the whole product development team works on one project.

According to the interviewee, nowadays the whole product development team focuses on one development project at a time, whereas in the past, each product developer was responsible for one product. The development work at the target company has become project-based teamwork, and it can be assumed that project management as part of work has become more important than in the past.

When considering how the documentation process should be developed, all of the interviewees agreed that a specific party responsible for the process should be defined. The interviewees mentioned that of the departments at the target company, the product development should be responsible for the documentation projects. Interviewee E elaborates that the product development should be the process owner, because documentation projects require most contribution from the product developers. Additionally, sales and marketing was mentioned by the interviewees as a department that should participate in developing the process. In essence, all of the interviewees regarded the roles of the departments to remain the same with product development producing the technical documentation, and sales and marketing taking care of translation and print.

Although product development has been named to be responsible for the technical documentation, in practice no party has taken responsibility for it, because the technical documentation crosses organisational boundaries during the process. This is why appointing the whole department to be responsible for the documentation process is not functional, as can be seen in interviewee A's answer when discussing project X:

> (Interviewee A) I would have started gathering information a lot earlier, and appointed a person who is in charge [of the documentation project]. Because no one was really in charge of it, or everyone was in charge, which means that no one's in charge.

While interviewee A mentions that project X should have been started earlier, the response also stresses the importance of a specific person who is in charge of the project, because no one was responsible for project X. Additionally, interviewee E mentions "shared responsibility, i.e. no one's responsibility" to have been a problem in previous documentation projects.

Shared responsibility seems to have led to a lack of project management in project X, because no one planned and supervised the project: all of the interviewees mentioned that the problems could have been avoided by means of project management, such as scheduling and resourcing. Moreover, the need for a project manager was voiced by three interviewees, who acknowledged that the process should be developed by appointing a person in charge of future projects. According to interviewee A, it would be ideal if the person in charge had knowledge about the machine, the information needed by the user, and the production of technical documentation. This idea of a person in charge is not a new one at the target company, as discussed by Interviewee E, who mentions that "bigger companies have a full-time employee responsible for documentation". However, two of the interviewees say that employing a

person concentrating on technical documentation would not be possible at the target company because of the business costs.

6 Developing the documentation process

In this chapter, I will use the information gathered in the interviews to answer the research questions, which is why each subsection is dedicated to one of the research questions. Thus, at first, I will discuss the state of the current documentation process of the target company. Then, I will discuss the status of technical communication in the company. Finally, I will propose changes to be made to improve the process.

6.1 The current documentation process

In this subsection, I will answer the research question "What is the state of the current documentation process at the target company?" by discussing the overview of the process, the issues in the process, and the maturity of the process. Thus, this subsection starts the development of processes presented in subsection 3.3 by carrying out the current state analysis as well as the analysis of the possible problems.

6.1.1 Overview of the current process

Diagram 6 illustrates the phases in the current documentation process.

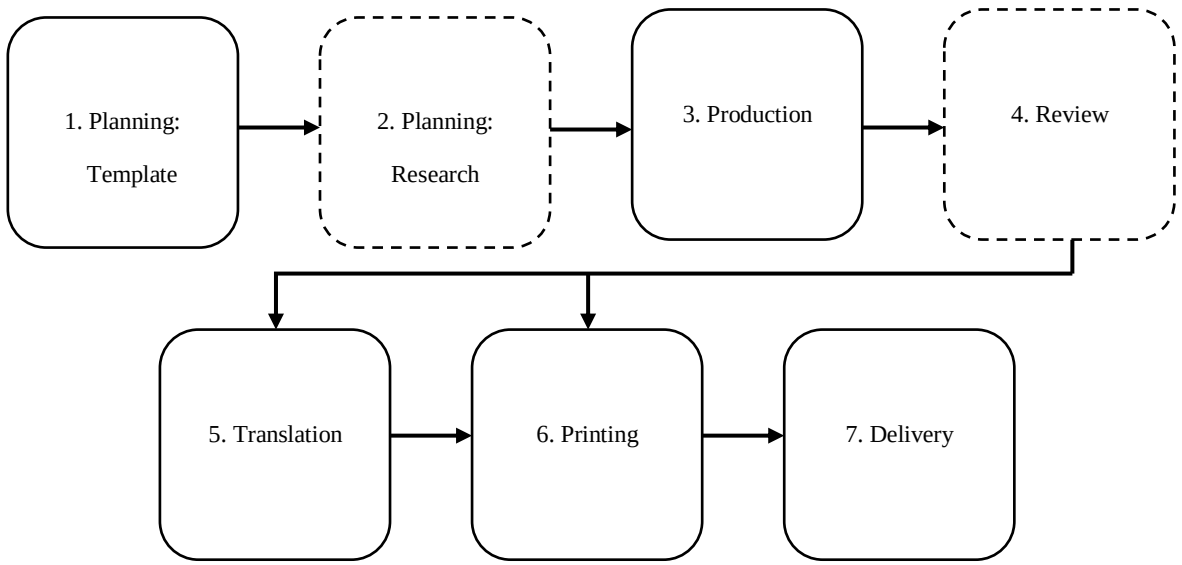

Diagram 6. The current documentation process at the target company

Producing a model for the current documentation process is challenging, because the interview results were somewhat varied. Therefore, in Diagram 6, two phases were encircled

with dashed lines to indicate a phase that does not necessarily occur in each documentation project.

The interview results indicate that the current documentation process at the target company begins at the end of the product development process. As illustrated in Diagram 6, the process starts with a template, which has been used in previous documentation projects. The table of contents of the template is modified to suit the documented product. If possible, existing technical documentation for similar products is researched and used to draw on content for the technical documentation to be produced. These two phases can be regarded as planning phases: the template is a ready-made plan for the technical documentation, and the product developers research the existing technical documentation to draw on the existing content.

The planning phases are followed by a production phase. The activities in the production phase only include producing content according to the table of contents of the template. The interview results do not specify what the production phase involves, rather, the results imply that the content is just produced by product development. When product development has produced the content for the Finnish version of the technical documentation, the content in the Finnish version is possibly reviewed by another product developer. Then the technical documentation is forwarded to sales and marketing, which checks the presentation of the version and forwards the version to translation and print performed by outside vendors. Finally, the production department orders a necessary number of documents and delivers them to the customer with the product.

6.1.2 Issues in the process

The issues in the current documentation process of the target company lie partly in the relation between the product development process and the documentation process: as the current documentation process starts after the product has been designed and gone into production, there is only a limited amount of time to be spent on the documentation project. As mentioned in subsection 3.1, this leads to struggles in delivering technical documentation on time and meeting quality requirements. As indicated by the interview results, at the target company, both of these issues occurred in project X, because the produced technical documentation did not meet the quality criteria of the company and was not the finalised version to be delivered.

In addition to the whole documentation process starting late, the phases in the process do not contribute to achieving the aims of delivering the final version of technical documentation on time. For example, although a ready-made template is used as a starting point, the content is produced without much planning. Moreover, information research involves only determining what existing material can be used in the new technical documentation. Furthermore, the interview results indicate that the documentation projects themselves are not planned by producing a schedule, for example. This is in contrast to the presented development models, which included planning both the technical documentation and the project, as discussed in subsection 3.4.4.

The lack of planning projects may cause problems if, for example, time is not scheduled for phases such as translation and print. The interview results indicate that translation and print are not considered integral phases of the documentation process, because they are performed by outside vendors. However, these phases are necessary before the technical documentation can be delivered to the customer, because the technical documentation has to be delivered in a printed form with the machine. Moreover, as mentioned in the interviews, translations of the technical documentation have become even more important, as the role of export has grown in the industry. As mentioned in subsection 3.4.4, disregarding phases can result in difficulties in responding to changes and delivering technical documentation on time. Especially phases performed outside the company, such as translation and print, have to be taken into account, because it is difficult to shorten the time required for these phases.

If the documentation project is not planned, the time needed for quality assurance of the technical documentation can be limited or non-existent. As indicated by the interview results, in project X, there was no time for reviewing the first version of the technical documentation, because the product was already ready for delivery. Moreover, the contradicting interview results regarding reviewing indicate that reviewing as a phase either does not occur or the employees are not aware of such a phase taking place. At the target company, a lack of reviewing has had some effect on other processes as well: as mentioned in the interviews, the problems in quality of the Finnish version may arise in the translation phase. This is supported by a claim discussed in subsection 3.1, in which translation phase as an interconnecting process performed by outside vendors is affected by the documentation process, which means that problems in the primary version of technical documentation are likely to appear in the translated versions.

Even if the technical documentation is reviewed at the target company, the quality assurance mainly concentrates on the correctness of the content in the documentation. Other characteristics of quality, such as spelling, grammar, and formatting mentioned in subsection 2.4, are disregarded. However, although the quality assurance at the target company disregards language use, it is regarded as a part of quality. The interview results indicate that the quality in technical documentation is considered to include clarity, readability, and coherence, which are affected by the use of standard language and linguistic correctness of the text.

As discussed in subsection 2.4, if the content and the style of the documentation are not considered from the user's point of view when producing the documentation, the documentation is unlikely to be usable. The interview results indicate that the quality of the technical documentation at the target company was also thought to be affected by the information required by the user: the need for developing technical documentation at the target company was prompted by user's needs, because the older technical documentation did not include information needed by the user. Additionally, product developers were thought to be prone to including superfluous information in the documentation. Therefore, it seems that, at the target company, quality technical documentation means meeting the needs of the user.

As discussed in subsection 3.2, even if a sound process has been established in a company, the process is unlikely to produce desirable results, if it is not managed and followed. As discussed in the interviews, the issues in the current process at the target company essentially stem from a lack of management: the documentation process does not seem to be managed, which results in not meeting the quality and time targets of the documentation projects, such as project X.

6.1.3 Maturity of the current process

When assessed with Hackos' process maturity model presented in subsection 3.3.1, the current documentation process at the target company can be placed at Level 1. As discussed in subsection 6.1, the current documentation process lacks an established process, which is a key feature of an ad hoc organisation. Additionally, the documentation process starts after the product development process, which leads to problems in quality. The projects are not planned, let alone managed, which results in difficulties in keeping them under control.

Some of the features of Level 0 also apply to the current documentation process: according to the maturity model, technical documentation in an oblivious company is produced by some other than a technical communicator, as it is done in the target company. Additionally, the maturity model states that product developers in an oblivious company do not have time, skills, or inclination for producing quality technical documentation, which is also implied in the interview results of the study at hand. However, while producing documentation is not recognised as a process in an oblivious company, the target company has a base of a process, which is why the current documentation process seems to be at Level 1.

The maturity model states that to move from Level 1 to Level 2, the documentation process has to be improved into a more established state, and standards for technical documentation have to be developed. To provide ways to improve the documentation process, I will present my suggestion for improvement in subsection 6.3.

6.2 Status of technical communication at the target company

In this subsection, I will answer the research question "What is the status of the technical communication in the company?" by discussing the answers of the interviewees.

The interview results indicate that the production of quality technical documentation is considered important, because it contributes to successful marketing and legal protection of the company. Although the importance of technical documentation seems to be well known among the interviewees, producing it is not motivating for some of the employees. Documentation tasks are not a top priority for the product developers, which might also affect the success of documentation projects.

The interview results imply that one reason why the documentation tasks do not seem to be interesting is that they are considered to be difficult. This is not surprising, because the interviewees have had little training in producing technical documentation. Instead, the interviewees have received training in using documentation tools, such as CorelDraw, in the past. The product developers have also received training in requirements of CE marking, concentrating on the required content of the technical documentation. The interviewees mentioned that training in the use of the new documentation tool InDesign and the CE marking courses would be required in the future.

As the documentation tasks are considered secondary, uninteresting, and difficult, it is no wonder that the product developers would rather concentrate on product development duties than documentation tasks. In these circumstances, an outside vendor in technical communication would seem a good choice. However, because of the mixed experiences, the services of outside vendors are not an obvious solution. Apart from a vendor with previous knowledge of the product to be documented, vendors were seen to hinder instead of ease the product developers' work, because they required collaboration with the developers. As the product developers were not prepared for collaboration, it seems that product developers did not have enough knowledge on how professionals in the field produce documentation. Thus, if the target company is going to employ vendors for documentation tasks in the future, it would be necessary for both parties to make clear what they require from each other.

Although the company's process flow diagram (Appendix 1) for producing technical documentation states that "user manuals are handled as all other purchasable components" [my translation], the interview results imply that documentation is not regarded an inherent part of the product that is worth being invested in. This view manifests itself in project X, in which the machine was delivered with the first version of the documentation instead of a revised version. On the other hand, interest in improving the technical documentation in project X indicates that the importance of producing a finalised version of a documentation is understood in the company.

All in all, it seems that technical communication has a somewhat low status at the target company. However, despite the status, the interview results indicate that the employees are committed to developing the process. As discussed in subsection 3.3, the participants developing a process need to acknowledge, understand, and accept change to become committed to change. Thus, in order to understand how and why technical documentation is produced, training in technical communication would be required at the target company. Training in technical communication would also improve the field's status in the company, as the employees would gain knowledge on what the profession is actually about, as mentioned in subsection 2.1.

6.3 Changes in the process

In this subsection, I will answer the research question "How could the documentation process be improved?" by discussing the changes to be done in the resources, and the phases in the

new process. I will apply the analysis of the development models presented in subsection 3.4.4 to formulate a new development model for the target process. Thus, this subsection continues the development of processes presented in subsection 3.3 by developing improvement suggestions and a new development model.

6.3.1 Resources

- **Process manager.** A person responsible for the documentation process should be appointed. As indicated by the interview results, it would be only natural to appoint a process manager from product development, because the department is responsible for producing the primary version of the technical documentation. The tasks of the process manager include producing and updating plans for both the documentation projects and the technical documentation, managing projects, arranging training, and developing the process.

- **Training in technical communication.** Training in the production of technical documentation is required. As indicated by the interview results, the employees need training in the use of the new documentation tool. Additionally, training in producing technical documentation would also be needed, so that the employees could, for example, make use of audience analysis methods to identify their users, as well as information design and writing strategies on how to cater for those users.

- **Standards.** As mentioned in the process maturity model in subsection 3.3.1, moving from Level 1 to Level 2 involves developing standards for technical documentation. Therefore, standards for quality assurance of the documentation should be developed at the target company. Standards should be used when producing and reviewing versions to ensure that the final version aligns with the developed quality standards.

- **Outside vendors.** Using the services of outside vendors in the production of technical communication should be considered. Even if the technical documentation is not entirely produced by outside vendors, their services could be useful when researching the users of the product or revising versions of the documentation.

6.3.2 Phases in the new process

As discussed in subsection 6.1, the current process is not an established process, because the employees themselves are not aware of the phases in the process. Therefore, to move from

Level 1 to Level 2, the phases should be defined. Diagram 7 illustrates the development model for the proposed documentation process.

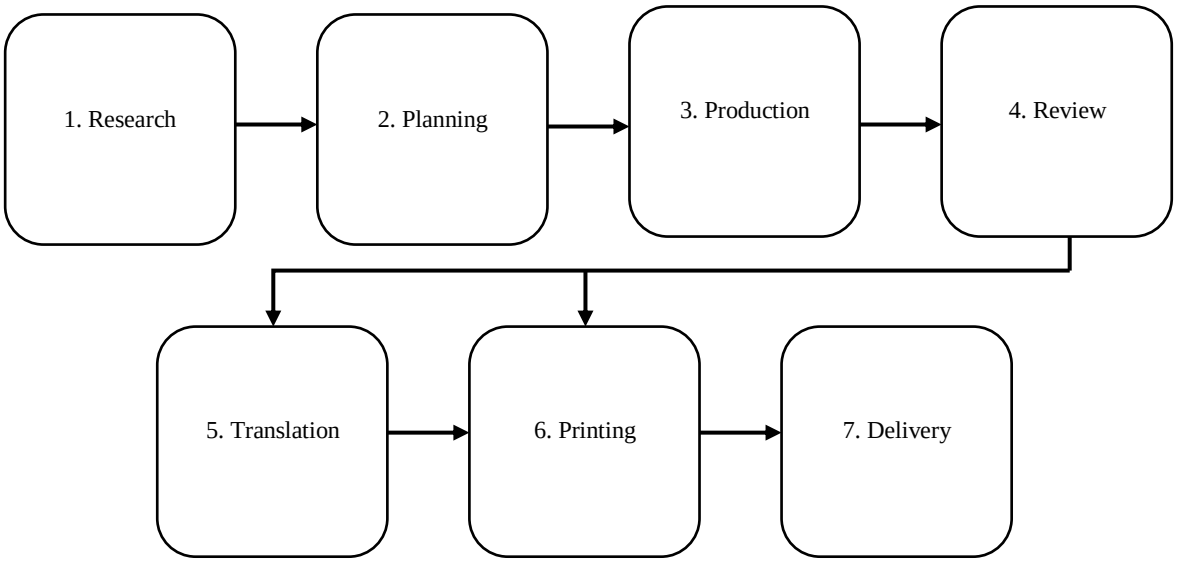

Diagram 7. The proposed documentation process at the target company

The development model illustrates the phases for producing both the primary Finnish version of the technical documentation and the translated versions. In the development model, the responsibilities of the departments are the same as in the current documentation process: product development is responsible for the production of the Finnish version, sales and marketing takes care of translation and print, and production orders and delivers the required number of technical documentation.

The proposed documentation process starts at the beginning of the product development process when the product development project itself is planned. As discussed in subsection 3.1, the documentation process should interact with the product development process. Therefore, the proposed documentation process should interact with the product development process at the target company, which would benefit both the product and the technical documentation. For example, Phase 1 in the development model would give the product developers the opportunity to get to know the users of the product, which would contribute to the design of both the product and the technical documentation.

Research. Phase 1 in the model includes researching the users of the product. As the product developers themselves produce the primary version of the technical documentation, it is not

necessary to research the product, rather, they analyse the users and the use of the product. This is to determine what kind of information is needed by the users, which contributes to quality of the technical documentation. In practice, researching the users and the use of the product can be done by gathering information from customer support calls, developing personas, and interviewing and observing the users during onsite research, for example. Additionally, in this phase, the existing material is researched to check whether some of its content can be reused.

Planning. Phase 2 in the model includes planning the project and the technical documentation to be produced. As in the current process, the template is used to specify the contents of the technical documentation. However, as presented in Kister's model in subsection 3.4.3, the template can also be used as "a work breakdown structure to divide the project into manageable components, which facilitates meeting deadlines". Therefore, the template can also be used as a base for the project plan to determine, for example, what content will be produced by whom. The project plan will also include a schedule, which specifies not only the tasks of the product development department but also takes into account phases performed by other departments and outside vendors. As the product is liable to change during the product development process, information in the technical documentation is liable to change as well. Therefore, this phase includes iteration: as more information becomes available, plans for both technical documentation and the project should be updated and added to detail accordingly, as discussed in subsection 3.4.4.

Production. Phase 3 in the model includes the production of text and graphics. As discussed in subsection 3.4.4, Hackos places writing, reviewing, and modifying into the same phase. In the proposed model, reviewing and modifying are placed in Phase 4, because a draft of the documentation has to be produced before it can be reviewed and modified. Thus, the deliverable of Phase 3 is a version of the technical documentation.

Review. Phase 4 in the model includes reviewing the first version of the technical documentation. As discussed in subsection 3.4.4, Kister's model places reviewing and refining into two separate phases that interrelate with each other. In the proposed model, Phase 4 includes the two activities as they are inherently linked and iterative in nature. Additionally, as suggested by Nickl in subsection 2.4, reviewing should be focused on different aspects of quality in documentation. Therefore, in the proposed model, reviewing is carried out in two separate phases focusing on particular aspects of quality, namely content,

language use, and style. The content of the documentation is reviewed and refined by another product developer. Other features, such as language use and style, is checked and modified by a person trained to produce technical documentation, who is either an in-house resource or an outside vendor. When reviewing the version, the content is evaluated against the quality standards of documentation. After this phase, the technical documentation is forwarded to sales and marketing.

Translation. In Phase 6, sales and marketing forwards the Finnish version of technical documentation to a translation vendor, and receives the translated versions. As discussed in subsection 3.4.4, only Hackos' development model includes translation and printing of the documentation. The proposed model includes the two activities because, as mentioned in subsection 3.4.4, it is challenging to shorten the time needed for them as they are performed by outside vendors. Thus, these activities should be added to the project plan at the beginning of the project.

Printing. In Phase 7, sales and marketing forwards technical documentation to the printing house, and receives the printed versions. Similar to Phase 6, Phase 7 is dedicated for only one activity. The proposed model places translation and printing into separate phases to demonstrate that they have to be taken into account separately when planning the documentation project, as the phases are carried out by different outside vendors.

Delivery. In Phase 8, production orders the required number of documents and delivers them to the customer. As discussed in subsection 3.4.4, this phase also signifies the end of the documentation project. Additionally, similar to Hackos' and Kister's models, this phase involves evaluating the project, and considering improvement suggestions for the documentation process.

7 Conclusion

The study at hand is a qualitative case study, which investigated both the state of the current documentation process and the status of technical communication at the target company. As the interview results indicate, the current documentation process lacks an established process, and the core reason for issues in the process is the lack of management. The issues in the documentation process reflect the status of technical communication which is somewhat low, and considered to be "a necessary evil".

The results of the study support my assumption that there are issues in the documentation process, which affect both the other processes and the quality of the technical documentation. There were struggles in delivering technical documentation that met the target company's quality requirements in project X. Furthermore, as a review phase does not necessarily take place in each documentation project, issues in quality of the documentation may emerge in other processes, such as translation.

As to the interview method, interviewing the participants in the documentation process was appropriate for the purpose of this study. The interview questions succeeded in gathering information on the documentation process and the status of technical communication in the company. However, some of the answers were contradicting, which caused difficulty in producing a reliable overview of the current process. On the other hand, differing views of the interviewees indicate that there is no uniform view of the production of technical documentation at the company, which, in turn, indicates that the process is not as established as it could be.

Reliability of the results may be influenced by the interview questions focusing on a specific documentation project, namely project X. Questions on project X were necessary, because it was the latest documentation project having been carried out in the target company, and thus fresh in the memory of the employees. Additionally, because of the unique circumstances in which project X was conducted – brand reform, new series of products, and the change in tools – it was difficult to build an overview of the technical communication at the target company. However, general interview questions also provided information on the previous documentation projects, which gave insight into the documentation process in the past.

Interview as a method requires careful planning from a researcher, who should be able to anticipate how interviewees interpret the questions. However, terms with which the

interviewees are familiar cannot always be anticipated by a researcher, who has little experience of the working context of the interviewees. Therefore, when planning interviews, it is necessary to ponder whether the terms and expressions are understood by the interviewees as intended. In the study at hand, defining technical documentation for the interviewees was necessary, because the definition of technical documentation was broader in the interviewees' working context than in the study. However, although I had considered the expressions used in the interviews, I had not recognised the need for defining technical documentation. Therefore, in addition to anticipating the interviewees' interpretations in advance, testing the questions should always be done when using interview as a research method. Testing the questions in a pilot interview is likely to present the required modifications, as happened in this study.

In addition to the research method, the theoretical background – the process maturity model and the three development models – suited this study well. The current state of the documentation process was determined by comparing the interview results to Hackos' (1994) process maturity model, which provided useful indications for the changes to be made to improve the process. According to the process maturity model, the current process at the company could be improved by developing the process into a more established state, appointing a process manager, and developing standards for the technical documentation.

The development model for the new documentation process was formulated by using three different development models by Hackos (1994), Haramundanis (1998), and Kister (2016). As the three models included similar phases, it was easy to pinpoint phases that should be in a documentation process. However, the three models emphasised different aspects of the production of technical documentation, such as project management, quality assurance, and iteration, and provided thus the possibility to choose the most relevant aspects to the new documentation process. They provided not only a base for the new development model but also a base for assessing the current documentation process.

Although the results of the study are especially useful for the target company, it can provide useful information on documentation processes for other similar companies. The results can also give indications to other similar companies on how to improve their documentation processes. As this study provides a starting point for developing the documentation process, further research on the implementation of the changes in the target company would be required to assess the suitability of the new development model. Moreover, similar case

studies on documentation processes would be required to draw a more comprehensive picture of the state and issues of the production of technical documentation in companies in Finland and abroad.

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Data

Interviews with five employees at the target company. 15th – 17th of February 2016.

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Appendix 1

Note: In order to maintain the anonymity of the interviewees in this study, the column including the departments and employees participating in the process has been edited out.

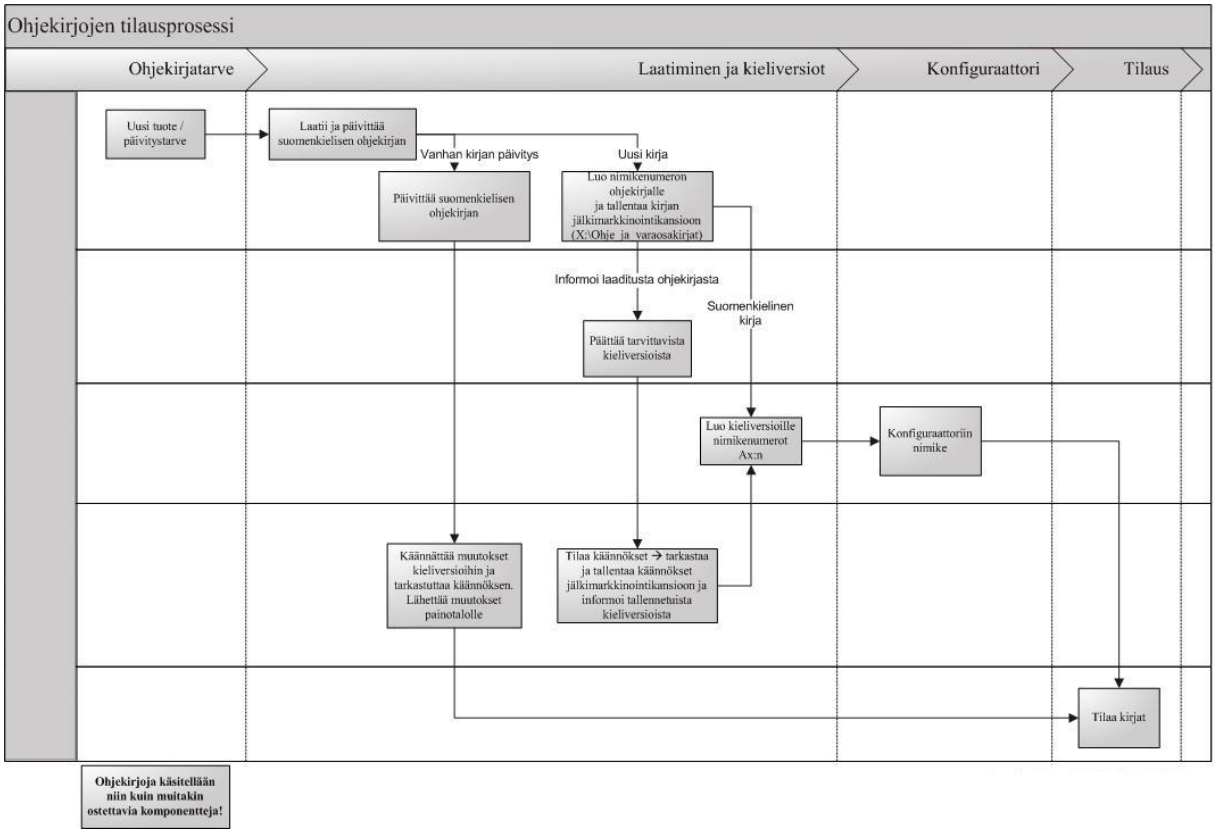


Diagram 8. Process flow diagram for producing manuals at the target company (in Finnish)

Appendix 2

Haastattelurunko

- Käytän haastatteluja vain tutkimustarkoituksessa, ja käsittelen ne luottamuksellisesti ja nimettöminä.
- Tutkimuksen tavoitteellinen valmistumisaika on huhtikuun lopussa ja se julkaistaan TamPub-julkaisuarkistossa.
- Kysyn aluksi työhösi liittyviä taustatietoja, sitten dokumentoinnista ja sen kehittämisestä. Haastattelu kestää noin tunnin.
- Tässä haastattelussa viittaan teknisellä dokumentaatiolla käyttöohje- ja varaosakirjoihin.
- Voit keskeyttää minut missä vaiheessa tahansa haastattelun aikana.
- Jos sinulla on jälkeenpäin kysyttävää tutkimuksesta, voit ottaa yhteyttä minuun sähköpostilla tai puhelimitse

Taustatiedot

- Mitkä ovat päätyötehtäviäsi yrityksessä?
- Kuinka kauan olet ollut töissä yrityksessä?
- Mitä dokumentointiin liittyviä tehtäviä sinulla on?
- Kuinka kauan olet tehnyt dokumentointiin liittyviä tehtäviä?
- Missä vaiheessa dokumentointia olet mukana?
- Miten tärkeäksi koet dokumentointiin liittyvät tehtävät verrattuna muihin tehtäviisi?
- Oletko saanut dokumentointiin liittyvää koulutusta?
    - Jos kyllä, mitä se on sisältänyt?
- Koetko tarvitsevasi dokumentointiin liittyvää lisäkoulutusta?
    - Jos kyllä, mitä sen pitäisi sisältää?

Dokumentointi ja laatu

- Miten määrittelisit dokumentoinnin eli mitä se mielestäsi tarkoittaa ja miksi sitä tehdään?
    - Mitkä ovat dokumentoinnin tärkeimmät tavoitteet?
    - Kuinka tärkeää dokumentointi on mielestäsi yrityksen kannalta eli mikä merkitys sillä on yritykselle?
- Mitä vaiheita uuden ohjekirjan dokumentointi sisältää?
- Mitä vaiheita ohjekirjan päivitys sisältää?
- Kuvaile dokumentoinnin ja tuotekehityksen suhdetta:
    - Miten dokumentoinnin eri vaiheet istuvat tuotekehityksen vaiheisiin?
- Kerro X-ohjekirjan dokumentoinnin etenemisestä.
    - Oliko eteneminen normaalin prosessin mukaista? Jos ei, miksi?
    - Mitä tavoitteita projektilla oli ja saavutettiinko ne? Jos ei, miksi?
    - Ilmenikö X-projektissa ongelmia? Jos kyllä, millaisia?
    - Jos saisit päättää, mitä tekisit toisin X-projektissa, jotta ongelmat vältettäisiin?
- Millaisia ongelmia dokumentointiprojekteissa on yleensä ollut?
    - Mitä vaikutuksia niillä on ollut sinun tehtäviisi?
    - Miten ne ovat vaikuttaneet dokumentaation laatuun?

- Millaista on mielestäsi laadukas dokumentaatio?

Dokumentoinnin kehittäminen

- Miten dokumentointia pitäisi mielestäsi kehittää eli mitä muutoksia prosessiin pitäisi tehdä?
- Jos prosessia aletaan kehittää, olisitko valmis olemaan mukana sen kehittämisessä ja ottamaan vastaan siihen liittyviä tehtäviä?
- Kenen tulisi mielestäsi vastata prosessin kehittämisestä ja kenen tulisi olla mukana siinä?

Muita kommentteja

- Onko mieleesi tullut jotakin muuta, mitä haluaisit mainita?

Suomenkielinen lyhennelmä

“Välttämättömän pahan” tuottaminen – dokumentointiprosessi ja teknisen viestinnän status teollisuusyrityksessä

Johdanto

Tämän tutkimuksen tarkoitus on kehittää teollisuusyrityksen dokumentointiprosessia. Dokumentointiprosessia kehitetään analysoimalla nykyistä prosessia ja sen ongelmakohtia sekä laatimalla prosessimalli uudelle prosessille. Tutkimuksessa tarkastellaan nykyisen dokumentointiprosessin lisäksi teknisen viestinnän statusta kohdeyrityksessä.

Tutkimuksen lähtökohdat juontuvat kesään 2015, jolloin olin kohdeyrityksessä harjoittelussa. Yrityksen dokumentointiprosessi oli tuolloin muutostilassa, sillä yrityksen dokumentointivälineet vaihdettiin uusiin ja ohjekirjapohjaa muokattiin uuden brändin mukaiseksi. Ohjekirjapohja päivitettiin dokumentointiprojektissa, jonka aikana laadittiin uuden tuotteen käyttöohje- ja varaosakirja. Tässä tutkimuksessa kyseisestä dokumentointiprojektista käytetään nimitystä *X-projekti* tietosuojasyiden vuoksi. X-projektissa ihmetystä herätti se, että dokumentaation ensimmäinen versio oli jo tehty, mutta lopullinen versio ei ollut valmistunut aikarajaan mennessä.

Dokumentointiprojektin lisäksi tutkimuksen lähtökohtana on kohdeyrityksen prosessikaavio, joka nimeää yrityksen osastot ja niiden tehtävät dokumentointiprojekteissa, mutta ei erittele dokumentaation tuottamiseen liittyviä tehtäviä. Oletuksena näin ollen on, että kohdeyrityksen nykyisessä dokumentointiprosessissa on ongelmia, jotka vaikuttavat sekä yrityksen muihin prosesseihin että teknisen dokumentaation laatuun.

Keskeiset käsitteet

Tämän tutkimuksen keskeiset termit ovat *tekninen viestintä*, *tekninen dokumentaatio*, *dokumentointiprosessi* ja *status*. Teknisen viestinnän määritteleminen yksiselitteisesti on vaikeaa, sillä yritykset ja dokumentoitavat tuotteet ovat erilaisia (Spilka 2002, 103; Rainey 2005, 200). Useat määritelmät ilmentävät nykyaikana kuitenkin dokumentaation käyttäjän merkitystä (Spilka 2002, 98). Koska tässä tutkimuksessa tarkastellaan dokumentointiprosessia, tutkimuksessa sovelletaan Isohellan (2011, 51) prosessikeskeistä määritelmää, johon lisätään käyttäjän merkitys. Tässä tutkimuksessa tekninen viestintä siis

tarkoittaa teknisen tiedon suunnittelua, tuottamista, välittämistä ja viestimistä käyttäjälle. Tekninen dokumentaatio voidaan sen sijaan määritellä teknisen viestinnän alalla dokumenteiksi, joita käytetään ohjaamiseen, markkinointiin ja raportointiin (Haramundanis 1998, 2–3). Tässä tutkimuksessa teknisellä dokumentaatiolla viitataan kohdeyrityksen dokumentointiprosessissa tuotettaviin käyttöohje- ja varaosakirjoihin.

Prosessi on toisiinsa liittyvien toimintojen joukko, joka on suunniteltu muuttamaan syöte tuotteeksi (Berman 2014, 15). Tutkimuksessa dokumentointiprosessi määritellään toisiinsa liittyvien toimintojen joukoksi, johon käytetään resursseja laadukkaan teknisen dokumentaation tuottamista varten. Koska tekninen dokumentaatio on tarkoitus toimittaa yhdessä dokumentoidun tuotteen kanssa, dokumentointiprosessin suhde tuotekehitysprosessiin täytyy ottaa huomioon prosessia kehitettäessä. Jotta laatuvaatimusten mukainen dokumentaatio voitaisiin toimittaa ajallaan, pitäisi dokumentointiprosessin ulottua tuotekehitysprosessin alusta loppuun ja olla vuorovaikutuksessa sen kanssa (Chisholm 1988, 311). Prosessien välinen sujuva vuorovaikutus ei kuitenkaan yksinään takaa menestystä liiketoiminnassa, sillä mahdollisten ongelmien taustalla on pohjimmiltaan puutteellinen prosessijohtaminen (Hackos 1994, 20–21). Puutteellinen johtaminen ja siitä johtuvat ongelmat sen sijaan aiheutuvat esimiesten vähäisestä dokumentointiin liittyvästä ymmärryksestä (Chisholm 1988, 304–307).

Status taas määritellään arvostukseksi, jota yhteisö osoittaa ammattilaisilleen (Kynell-Hunt 2003, 59). Teknisen viestijän status riippuu siis siitä, miten teknistä viestintää arvostetaan yhteisössä. Tekniset viestijät kokevat työnsä vähemmän arvostetuksi työyhteisössä, joka ei näytä ymmärtävän dokumentaation merkitystä tai teknisen viestijän työtehtäviä (Korhonen 2007). Ajattelutavan muutosta yrityksissä on pidetty teknisen viestinnän alan kirjallisuudessa tapana parantaa alan statusta. Teknisiä viestijöitä on rohkaistu muun muassa osoittamaan työpaikalla, mitä arvoa heidän työnsä tuottaa yritykselle (Redish 2003; Ward 2015) ja osallistumaan tuotekehitysprosessiin, jotta työyhteisö tulisi tietoiseksi teknisen viestijän tehtävistä (ks. Giammona 2011; Hart & Conklin 2011).

Tutkimusmenetelmä ja aineisto

Tutkimusmenetelmä tässä tutkimuksessa on puolistrukturoitu haastattelu. Puolistrukturoitu haastattelu sopii tutkimukseen, koska tutkimusaiheesta on jotakin harjoittelun aikana saatua näkemystä, mutta koko nykyprosessista ei ole enempää tietoa. Haastateltavat toimivat eri dokumentointitehtävissä ja työskentelevät joko tuotekehityksessä tai myynti- ja

markkinointiosastolla. Haastatteluaineisto koostuu viidestä haastattelusta, joista ensimmäinen oli pilottihaastattelu ja jotka kirjoitettiin puhtaaksi haastattelujen jälkeen.

Teoreettinen viitekehys

Haastatteluista kerättyä tietoa verrataan Hackosin (1994, 44–74) prosessien kypsyysmalliin, mikä antaa viitteitä prosessin nykytilasta ja siitä, miten prosessia voidaan kehittää. Kypsyysmallissa on kuusi kypsyystasoa. Hackosin mukaan suurin osa yrityksistä on tasoilla 1 tai 2, ja vain harvat tasolla 3. Jotkut yritykset ovat myös tasolla 0. Tasot 4 ja 5 ovat vain ihanteellisia, eikä niitä siksi käsitellä tässä tutkimuksessa. Koska kohdeyrityksen nykyprosessin kypsyys on todennäköisesti ensimmäisillä tasoilla, nykyprosessia verrataan tasoihin 0, 1, 2 tai 3.

- **Taso 0.** Tämän tason yritys ei tunnista dokumentointia prosessiksi. Teknisen viestijän sijaan dokumentaation tuottaa suunnittelija, joilla ei ole aikaa, taitoja tai halua tuottaa laadukasta dokumentaatiota. Lisäksi suunnittelijat eivät pidä teknisiä viestijöitä tarpeellisina yrityksessä. Prosessin kehittämiseksi yritykseen pitäisi palkata teknisiä viestijöitä, jotka tuottaisivat käyttökelpoisempaa dokumentaatiota ja vakiinnuttaisivat prosessia.

- **Taso 1.** Tämän tason yrityksen prosessi ei ole vakiintunut. Projekteja ei suunnitella ja ne alkavat tuotekehityksen loppupuolella. Dokumentaation laatua ei voida varmistaa ajan puutteen vuoksi. Yrityksessä on teknisiä viestijöitä, jotka työskentelevät itsenäisesti, minkä vuoksi dokumentaatio ei ole tyyliltään yhtenäistä. Projektinhallinta tai työntekijöiden yhteistyö on puutteellista. Prosessin kehittämiseksi uuden työntekijän tai ulkopuolisen konsultin pitäisi valmistella uusi prosessi yritykselle. Lisäksi yrityksessä tuotettavalle dokumentaatiolle pitäisi kehittää laatustandardit.

- **Taso 2.** Tämän tason yrityksessä on kehitetty dokumentointiprosessin perusta, ja yrityksessä projektit suunnitellaan laatimalla projektikuvaus ja dokumentaation luonnos. Projektinhallintaa ei silti yrityksessä ole, minkä vuoksi projekti ei vastaa hyvin muutoksiin. Prosessin kehittämiseksi yrityksessä pitäisi nimittää prosessipäällikkö, joka vastaa dokumentointiprosessin vakiinnuttamisesta ja projektien suunnittelusta.

- **Taso 3.** Tämän tason yrityksellä on varsin pitkälle kehittynyt dokumentointiprosessi. Yrityksessä dokumentaatio ja projekti suunnitellaan ja toteutetaan suunnitelman mukaisesti. Työntekijät tekevät yhteistyötä, ja editoija tarkistaa dokumentaation kielen. Siirtyminen seuraavalle tasolle tapahtuu, kun projektit pysyvät hallinnassa, ja työntekijät alkavat luottaa prosessiin.

Uuden dokumentointiprosessin mallintamisessa käytetään Hackosin (1994), Haramundanisin (1998) ja Kisterin (2016) dokumentointiprosessimalleja. Mallien vaiheet voidaan jakaa suunnittelu-, tuotanto- ja toimitusvaiheisiin.

- **Suunnitteluvaiheet.** Prosessimallien ensimmäiset vaiheet ovat suunnitteluvaiheita. Hackosin prosessimallissa ensimmäiset vaiheet sisältävät projektiin ja tuotteeseen liittyvän tiedon hankkimista sekä projektin ja dokumentaation suunnitelmien laatimista. Haramundanisin ja Kisterin mallit sisältävät Hackosin suunnitteluvaiheiden toimintojen lisäksi tiedon analysointia sekä dokumentointi- ja toimitustapojen valmistelua.

- **Tuotantovaiheet.** Prosessimallien tuotantovaiheet sisältävät teknisen dokumentaation kirjoittamista, arviointia ja muokkaamista. Hackosin mallissa on kaksi tuotantovaihetta, joista ensimmäinen sisältää usean dokumentaatioversion kirjoittamisen, arvioinnin ja muokkaamisen. Toinen tuotantovaihe sisältää viimeisen version kääntämisen ja painatuksen. Myös Haramundanisin mallissa on kaksi tuotantovaihetta, joista ensimmäinen sisältää dokumentaation kirjoittamista ja toinen version arviointia ja muokkaamista. Toisin kuin Hackos, Haramundanis ja Kister eivät ota huomioon muita prosesseja, kuten kääntämistä ja painatusta. Kisterin mallissa kuvataan kolme erillistä tuotantovaihetta, joissa versio kirjoitetaan, arvioidaan ja muokataan. Lisäksi Kisterin mallissa dokumentointivälineitä kehitetään tuotantovaiheissa tarpeen mukaan.

- **Toimitusvaiheet.** Prosessimallien viimeiset vaiheet merkitsevät dokumentointiprojektin loppua. Kisterin mallin toimitusvaiheissa teknisen dokumentaation viimeinen versio toimitetaan ja projekti arvioidaan. Sen sijaan Hackosin mallin viimeinen vaihe sisältää pelkästään projektin arviointia ja seuraavan projektin suunnittelua, koska mallissa toimitus on sijoitettu tuotantovaiheeseen.

> Haramundanisin malli sen sijaan ei ota huomioon dokumentaation toimitusta, vaan siinä vain vastaanotetaan dokumentaatio sähköisessä tai paperisessa muodossa.

Hackosin, Haramundanisin ja Kisterin prosessimalleissa korostetaan iterointia, projektinhallintaa ja laadunvarmistusta, jotka kannattaa ottaa huomioon prosessin kehittämisessä. Iterointia ilmenee muun muassa tiedonhankinnassa ja versioiden tuotannossa. Koska suurin osa tiedosta tulee saataville projektin edetessä, tietoa kerätään koko projektin ajan. Näin ollen suunnitelmia päivitetään ja tarkennetaan projektin edetessä. Versioiden tuotantovaiheessa taas versioita arvioidaan ja muokataan, kunnes lopullinen versio on valmis.

Prosessimallit sisältävät myös projektinhallintaan liittyviä toimintoja, kuten projektin suunnittelua, hallintaa ja arviointia. Projektipäällikkö on vastuussa projektin seurannasta, jotta projekti pysyy aikataulussa ja budjetissa. Projektipäällikkö tekee dokumentaation ja projektiin liittyvät suunnitelmat. Prosessimallien laadunvarmistus sen sijaan käsittää dokumentaation versioiden arviointia ja muokkaamista. Laadunvarmistus voi myös sisältää arvioinnissa käytettävien dokumentointivälineiden, kuten tyyliohjeiden ja dokumenttimallien, valmistelua. Laadunvarmistukseen voivat osallistua eri asiantuntijat: suunnittelijat voivat tarkistaa asiasisällön ja editoijat dokumentaation kielen.

Ongelmat kohdeyrityksen dokumentointiprosessissa

Ongelmat kohdeyrityksen dokumentointiprosessissa johtuvat osittain sen suhteesta tuotekehitysprosessiin. Koska dokumentointiprosessi alkaa vasta, kun tuote on suunniteltu ja laitettu tuotantoon, aikaa on rajallisesti dokumentointitehtäviä varten. Ajanpuute oli yksi syy siihen, miksi X-projektissa asiakkaalle toimitettu dokumentaatio ei ollut yrityksen laatukriteerien mukainen viimeistelty versio.

Kohdeyrityksen nykyisen dokumentointiprosessin vaiheet eivät myöskään edistä viimeistellyn version toimittamista ajallaan, sillä dokumentaation suunnittelu ja tiedonhaku on puutteellista. Nykyprosessissa tiedonhaku käsittää vain uudelleenkäytettävän materiaalin valitsemisen, eikä itse dokumentointiprojektia suunnitella tarkasti. Koska dokumentointiprojektia ei suunnitella, laadunvarmistukseen tarvittavaa aikaa ei ole paljon: X-projektissa ei ollut aikaa dokumentaation tarkistamiseen, sillä kone oli jo valmis toimitettavaksi. Laadunvarmistusta ei näytä juurikaan prosessissa olevan, sillä haastattelutulosten mukaan dokumentaation tarkistukselle ei ole olemassa vakiintunutta vaihetta, tai työntekijät eivät ole tietoisia sen

olemassaolosta. Tarkistuksen puuttuminen on vaikuttanut dokumentointiprosessiin liittyvään käännösprosessiin, jossa ongelmat suomenkielisen dokumentaation laadussa tulevat ilmi.

Vaikka laadunvarmistusta olisikin, se keskittyy pääosin dokumentaation teknisen sisällön oikeellisuuteen. Muita dokumentaation laadun osatekijöitä, kuten kielioppia, ei tarkisteta. Haastatteluiden perusteella dokumentaation kieltä kuitenkin pidetään kohdeyrityksessä laadun osatekijänä, koska se vaikuttaa dokumentaation selkeyteen, luettavuuteen ja johdonmukaisuuteen. Dokumentaation laatuun liitetään yrityksessä myös käyttäjälähtöisyys, sillä dokumentoinnin kehittämisen lähtökohtana oli käyttäjän tarvitseman tiedon sisällyttäminen dokumentaatioon.

Kohdeyrityksessä kääntämistä ja painatusta ei pidetä kiinteänä dokumentointiprosessin osana, koska ne teetetään käännöstoimistossa ja painotalossa. Dokumentaation painatus on kuitenkin tärkeää, sillä dokumentaatio on toimitettava asiakkaalle paperisena versiona tuotteen mukana. Koska tuotteiden vienti ulkomaille lisääntyy, hyvistä käännöksistä on myös tullut yhä tärkeämpiä. Vaiheiden sivuuttaminen dokumentointiprosessissa saattaa johtaa ongelmiin muutostilanteissa ja dokumentaation toimituksessa. Kääntämisen ja painatuksen huomioiminen projektin suunnittelussa on erityisen tärkeää, koska ne teetetään yrityksen ulkopuolella eikä niihin tarvittavan ajan määrään voida yrityksessä siten helposti vaikuttaa.

Vaikka kohdeyrityksen dokumentointiprosessin vaiheet olisivatkin vakiintuneet, prosessi ei todennäköisesti tuota toivottua lopputulosta, jos sitä ei johdeta ja valvota. Nykyisen dokumentointiprosessin ongelmat johtuvat siis pohjimmiltaan puutteellisesta johtamisesta, sillä prosessille ei ole nimitetty vastuuhenkilöä.

Kohdeyrityksen nykyprosessin kypsyys

Kohdeyrityksen nykyinen dokumentointiprosessi on Hackosin prosessin kypsyysmallin mukaan tasolla 1, koska nykyisen prosessin vaiheet eivät ole vakiintuneita. Nykyprosessin kypsyys vastaa tasoa 1 myös siksi, että dokumentointiprosessi alkaa tuotekehitysprosessin jälkeen, mikä johtaa laatuongelmiin. Lisäksi projektien vähäinen hallinta ja suunnittelu ovat tekijöitä, jotka viittaavat tason 1 kypsyyteen. Kohdeyrityksessä nykyprosessia pitäisi siis

kypsyysmallin mukaan kehittää vakiinnuttamalla prosessi ja laatimalla laatustandardit dokumentaatiota varten.

Teknisen viestinnän status kohdeyrityksessä

Haastatteluiden perusteella laadukasta teknistä dokumentaatiota pidetään tärkeänä kohdeyrityksessä, koska se on osa onnistunutta markkinointia ja antaa lain suojan yritykselle. Dokumentointitehtävät eivät kuitenkaan motivoi kaikkia työntekijöitä, koska niitä pidetään hankalina. Haastateltavilla onkin vain vähän dokumentaation tuottamiseen liittyvää koulutusta, ja saatu koulutus on keskittynyt dokumentointivälineiden käyttöön ja CE-merkinnän vaatimuksiin dokumentaation sisällöstä.

Teknisen viestinnän alan toimijoista kohdeyrityksessä on ollut vaihtelevaa kokemusta. Yhteistyötä alan palveluyrityksen kanssa pidettiin hankalana, koska sen koettiin vievän liikaa suunnittelijoiden aikaa. Sen sijaan yhteistyö sujui paremmin sellaisen yrityksen kanssa, jonka työntekijä tunsi ennestään kohdeyrityksen tuotteet. Lisäksi dokumentaatiota ei pidetä osana tuotetta, johon kannattaisi panostaa. Esimerkiksi X-projektissa tuotteen mukana ei toimitettu dokumentaation viimeisteltyä versiota. Kohdeyrityksessä teknisellä viestinnällä näyttää siis olevan jokseenkin alhainen status, vaikka työntekijät ovatkin sitoutuneita kehittämään prosessia.

Dokumentointiprosessin kehittäminen kohdeyrityksessä

Resursseista prosessipäällikkö, koulutus, standardit ja palveluyritykset pitäisi ottaa huomioon dokumentointiprosessia kehitettäessä.

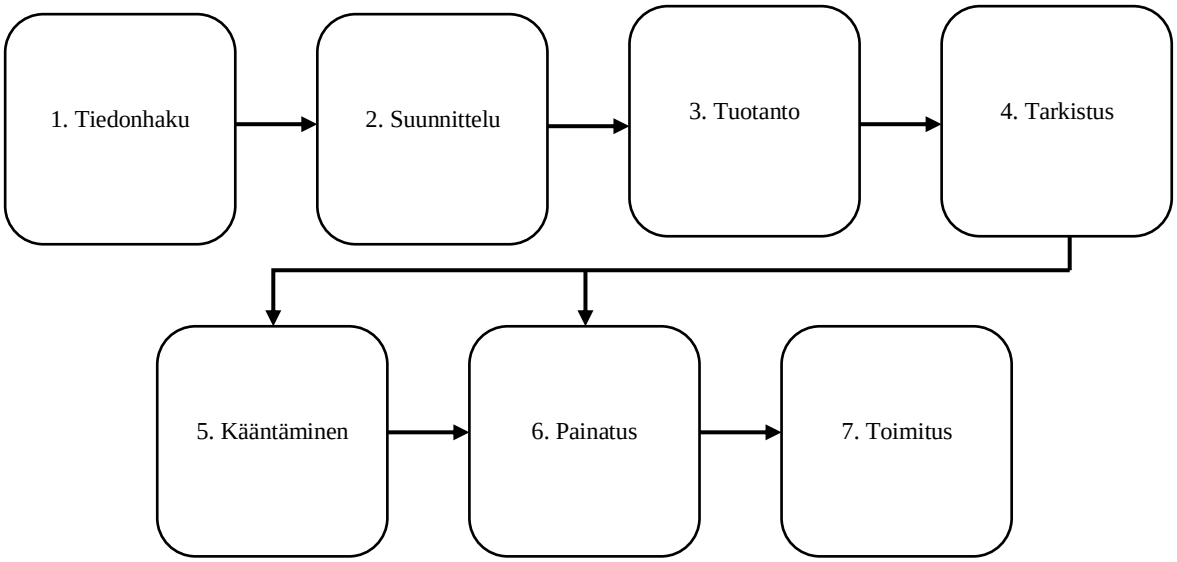
- **Prosessipäällikkö.** Prosessille pitäisi nimittää vastuuhenkilö, jonka tehtäviin kuuluu dokumentaation ja projektien suunnittelu, projektien hallinta, koulutuksen järjestäminen ja prosessin kehittäminen.

- **Koulutus.** Dokumentointiin liittyvää koulutusta pitäisi järjestää, jotta työntekijät osaisivat hyödyntää esimerkiksi käyttäjäanalyysiä käyttäjien tunnistamisessa ja informaatiosuunnittelua sekä kirjoittamisstrategioita tiedon esittämisessä käyttäjille.

- **Standardit.** Dokumentaatiolle pitäisi kehittää laatustandardit, joita käytetään dokumentaation tuottamisessa ja tarkistuksessa.

- **Teknisen viestinnän yrityksen palvelut.** Teknisen viestinnän yritysten palvelujen käyttöä voisi harkita uudelleen. Koko dokumentointiprojektin toteuttamisen lisäksi palveluja voisi hyödyntää esimerkiksi käyttäjien tarpeiden selvittämisessä ja dokumentaation editoinnissa.

Dokumentointiprosessin kehittämiseksi prosessin vaiheet pitäisi vakiinnuttaa kuvan 9 mukaisesti. Yrityksen osastojen vastuut ovat ehdotetussa prosessissa samoja kuin nykyisessäkin prosessissa. Tuotekehitys siis vastaa suomenkielisen dokumentaation tuottamisesta, myynti- ja markkinointiosasto huolehtii käännöksistä ja painatuksesta, ja tuotanto tilaa sekä toimittaa vaadittavan määrän dokumentteja. Dokumentointiprosessi alkaa tuotekehityksen alkuvaiheessa, jolloin tuotekehitysprojektia suunnitellaan. Prosessit ovat vuorovaikutuksessa keskenään, eli esimerkiksi dokumentointiprosessimallin tiedonhakuvaiheessa suunnittelijat hankkivat tietoa käyttäjistä, mikä edistää sekä tuotteen että dokumentaation suunnittelua.



Kuva 9. Ehdotus kohdeyrityksen uudeksi dokumentointiprosessiksi

- **Tiedonhaku.** Tiedonhakuvaiheessa kerätään ja analysoidaan tuotteen käyttöön ja käyttäjiin liittyvää tietoa, jotta saadaan selville, millaista tietoa käyttäjät tarvitsevat. Tietoa voidaan hakea esimerkiksi analysoimalla asiakkaiden yhteydenottoja, laatimalla persoonia sekä haastattelemalla ja havainnoimalla käyttäjiä tuotteen käyttötilanteessa. Tässä vaiheessa myös tarkistetaan, voidaanko olemassa olevaa materiaalia käyttää uudelleen.

- **Suunnittelu.** Suunnitteluvaiheessa suunnitellaan sekä dokumentaatiota että dokumentointiprojektia. Ohjekirjapohjaa käytetään dokumentaation sisällön määrittämiseen. Pohjaa voidaan käyttää myös projektin suunnittelussa projektin osiin jakamisessa. Projektisuunnitelmaan sisällytetään aikataulu, joka huomioi tuotekehityksen tehtävien lisäksi muiden osastojen ja ulkopuolisten yritysten suorittamat vaiheet. Suunnitteluvaihe sisältää iterointia, koska uutta tietoa tulee saataville tuotekehitysprosessin edetessä, mikä vaikuttaa myös dokumentaation sisältöön. Kun lisää tietoa on saatavilla, dokumentaation ja projektin suunnitelmat päivitetään.

- **Tuotanto.** Tuotantovaiheessa tuotetaan teksti- ja kuvasisältö suomenkieliseen dokumentaatioon.

- **Tarkistus.** Tarkistusvaiheessa suomenkielistä versiota tarkistetaan ja muokataan iteratiivisesti, kunnes versio on viimeistelty. Tarkistusvaihe sisältää eri laatuun liittyvien osatekijöiden editointia. Dokumentaation asiasisällön tarkistaa ensiksi toinen suunnittelija, minkä jälkeen kielen ja tyylin tarkistaa yrityksen sisäinen tai ulkoinen resurssi, jolla on kokemusta dokumentoinnista. Tarkistusvaiheessa version sisältöä verrataan yrityksen dokumentaatiolle asettamiin laatustandardeihin. Tämän vaiheen lopussa dokumentaatio välitetään myynti- ja markkinointiosastolle.

- **Kääntäminen.** Käännösvaiheessa myynti- ja markkinointiosasto välittää suomenkielisen version käännöstoimistolle ja vastaanottaa käännetyt versiot.

- **Painatus.** Painatusvaiheessa myynti- ja markkinointiosasto välittää dokumentaation painotaloon ja vastaanottaa painetut versiot.

- **Toimitus.** Toimitusvaiheessa tuotanto tilaa tarpeellisen kappalemäärän dokumentteja ja toimittaa ne asiakkaalle tuotteiden mukana. Tämä vaihe osoittaa projektin valmistuneen. Toimitusvaihe sisältää myös projektin arviointia ja prosessin kehittämisen suunnittelua.

Päätelmät

Tämä tutkimus on laadullinen tapaustutkimus, jossa tutkitaan sekä nykyisen dokumentointiprosessin tilaa että teknisen viestinnän statusta kohdeyrityksessä.

Tutkimustulosten mukaan nykyinen prosessi ei ole vakiintunut, ja prosessin ongelmat johtuvat pohjimmiltaan puutteellisesta prosessijohtamisesta. Prosessin ongelmat heijastavat teknisen viestinnän jokseenkin alhaista statusta yrityksessä.

Tutkimus tukee olettamusta, jonka mukaan prosessissa on ongelmia, jotka vaikuttavat muihin prosesseihin ja dokumentaation laatuun. Esimerkiksi X-projektissa ensimmäisen dokumentaatioversion laatu ei vastannut kohdeyrityksen laatukriteereitä. Dokumentaation laatuongelmia saattaa ilmetä muissa prosesseissa, kuten käännösprosessissa, koska vakiintunutta tarkistusvaihetta ei nykyprosessissa ole.

Vaikka tämän tutkimuksen tulokset ovat hyödyllisiä erityisesti kohdeyritykselle, se voi tarjota hyödyllistä tietoa dokumentointiprosessista myös muille samanlaisille yrityksille. Tutkimus voi antaa viitteitä siitä, miten muissa yrityksissä dokumentointia voidaan kehittää. Tutkimus tarjoaa vain lähtökohdan dokumentointiprosessin kehittämiselle, joten jatkotutkimusta muutosten toimeenpanemisesta tarvittaisiin kohdeyrityksessä, jotta kehitettyä prosessimallia voitaisiin arvioida. Samanlaisia tapaustutkimuksia niin Suomessa kuin ulkomailla olevien yritysten dokumentointiprosesseista tarvitaan myös, jotta dokumentoinnin tilasta saataisiin teknisen viestinnän alalla kattavampi kuva.